

DEVELOPMENTAL TRENDS IN THE STRUCTURE
OF SELF-CONCEPT

BY

PAUL EWALD

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Abstract of Dissertation Presented to the Graduate School
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By

Paul Ewald

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Chairman: Patricia Ashton

Cochairman: James Algina

Major Department: Foundations of Education

The purpose of this study was to examine four of the definitional features of self-concept. The features tested were that self-concept is a) multifaceted, b) hierarchical in nature, c) decreasing in stability from general to specific levels, and d) increasing in stability with age.

A total of 428 subjects were administered a battery of self-concept instruments at two points in time 6 months apart. The battery included the Tennessee Self-Concept Scale, the Piers-Harris Children's Self-Concept Scale, and the Michigan State Self-Concept of Ability Scale. Data were analyzed for both the total sample and separately for 7th and 8th graders, 9th and 10th graders, and 11th and 12th graders.

Four models were tested for goodness of fit to the data with analysis of covariance structures. The hypothesized model was composed of five facets, including general, overall academic, and three subject-matter specific self concepts, and was found to provide the best fit to the data, thus supporting the multifaceted feature of the construct. An examination of interfactor correlations and estimated regression coefficients revealed limited support for the hierarchical feature of the construct. Stability coefficients decreased from general to specific factors for the middle age group only. The hypothesis that this feature becomes more pronounced with age was therefore not supported. The five factor model was found to be invariant across age groupings and test occasions, providing additional support for the multifaceted feature but failing to support the hypothesis that this feature becomes more pronounced with age. These findings were discussed in terms of the construct definition of self-concept and the development of self-concept during adolescence.

CHAPTER I

INTRODUCTION

The study of self-concept has a formidable history in the fields of psychology and education. In the psychological literature much of the impetus to study self-concept can be traced to the consensus among clinicians and personality theorists that persons who question their own self-worth are frequently unable to function effectively and often seek professional help. These impressions have led researchers such as Coopersmith (1967) to investigate the predetermining variables that contribute to the growing individual's sense of self-worth.

In the field of education, self-concept has received considerable attention due to the empirical relationship that has been established between student self-concept and academic achievement. This empirical finding is consistent with the theoretical writings that are suggestive of an association between perceptions of self-worth and the ability to function effectively. In a review of the literature, Purkey (1970) summarized the research in this area stating that "the research evidence clearly shows a persistent and significant relationship between the self-concept and academic achievement" (p. 15). Self-concept is clearly

considered to be a critical variable by psychologists and educators.

Research studies of self-concept, its antecedents and consequences, and its behavioral correlates currently number in the thousands. A review of this research has been compiled in two volumes by Wylie (1961, 1975). Other reviewers of the self-concept literature (Crowne & Stephens, 1961; Shavelson, Hubner, & Stanton, 1976) have agreed with Wylie's contention that our understanding of self-concept is still quite restricted due to the host of methodological problems unique to this area of research. These problems converge on issues of construct definition and validity.

Research concerning the construct validity of self-concept can be described formally in terms of a nomological network of associations (Cronbach & Meehl, 1955). The nomological network consists of within-construct studies, which examine the interrelationships among the definitional features of the construct itself, and between-construct studies, which examine the relationships between the construct and other variables of interest, such as academic achievement. Ideally, within-construct studies should precede between-construct studies. When this is not the case, there is the danger that between-construct studies may be designed around a poorly defined construct. In the research literature on self-concept, there is a conspicuous lack of within-construct studies resulting in contradictory and inconsistent findings. For example, the between-construct

relationship that has been established between self-concept and educational achievement has stimulated numerous intervention programs and experimental studies designed to either enhance self-concept as an end in itself or increase educational achievement via self-concept change. To effectively change self-concept requires a within-construct understanding of what self-concept is, how it develops, how it can be measured, and how change occurs. One likely explanation for the mostly negative results of the intervention programs designed to change self-concept (Scheirer & Kraut, 1979) is that the within-construct portion of the nomological network is not sufficiently developed to guide these efforts. Reviewers of the literature on self-concept (Shavelson, et al., 1976; Wylie, 1961, 1975) have repeatedly drawn this to the attention of the research community and have recommended that research should be conducted to validate the definitional features of self-concept.

Shavelson et al. identified the following seven critical definitional features of self-concept on the basis of the extant research:

1. The descriptive evaluative feature of self-concept refers to subjective self-inferences made on the basis of behavior and performance. In addition to describing oneself (e.g., I go to work each day), individuals evaluate themselves (e.g., I am a hard worker). On the basis of these self-evaluations, inferences about self in that particular area are made (e.g., I am a good worker), thus providing the

basis for the evaluative self-concept. Theoretically, the standard against which one evaluates oneself varies from person to person and culture to culture and is highly situation specific.

2. The multifaceted feature refers to the multiple areas in which self-inferences are made and which subsequently come to make up the unique individual self-concept. On the basis of self-evaluations, one might conceivably perceive oneself as being a superior athlete, a poor student, and one who is socially accepted by peers. Throughout life the individual has numerous experiences in each of these areas. Each experience provides some basis upon which self-evaluations and inferences can be made. If the individual repeatedly experiences success in a variety of sports activities, it is likely that the individual would make positive self-inferences to the effect that he or she is a superior athlete. Repeated school failure would likely lead to a poor self-concept of academic ability yet not directly influence self-concept of athletic ability.

3. Self-concept can be described as having a developmental feature. Children have limited experiences in the various facet areas. As they grow older, they learn to be more selective as to the areas in which they will willingly participate. This may be, in part, a defensive response to protect the developing self-concept. With age and experience self-concept becomes more differentiated. Young children tend to perceive themselves in a more global

sense rather than making fine distinctions among the various facets. The older individual, on the other hand, has acquired greater self-knowledge through experience, resulting in a more differentiated set of self-perceptions.

4. Self-concept is an organized construct. As self-concept becomes more differentiated with age, the individual must organize and categorize the available information about the self.

5. The structural organization of self-concept approximates a hierarchical arrangement. Perceptions of behaviors, which are at the base of the hierarchy, lead to inferences about the self in sub-areas, then to inferences about the self in academic and non-academic areas, and finally, to inferences about the self in general. The hierarchical feature of self-concept implies that self-concept facets can be classified on a dimension of specific self-concepts to general self-concept.

6. The sixth definitional feature concerns the stability of self-concept. The stability of self-concept is believed to vary by hierarchical level. The general self-concept, which is at the apex of the hierarchy, is conceived to be a highly stable property of the construct. The academic and non-academic facets of self-concept are considered less stable than the general self-concept yet more stable than the respective sub-areas of these facets. Self-concept is least stable at the base of the hierarchy where it is highly situation-specific.

7. The final definitional feature of self-concept is that it can be differentiated from other related constructs. This feature aids in generating hypotheses and predicting the direction of theoretical relationship. For example, as previously stated, an empirical relationship has been established between self-concept and academic achievement. Self-concept might be further differentiated from academic achievement by demonstrating that self-concept of overall academic ability is more highly related to grade-point-average than physical self-concept and that physical self-concept is more highly related to body build than to grade-point-average.

In addition to identifying and describing these seven definitional features that emerged from the extant research, Shavelson et al. (1976) reviewed procedures for construct validation and emphasized the need for within-construct studies to examine the evidence in support of these features.

Background of the Problem

Responding to the need for construct validation of the definitional features of self-concept, Shavelson and Bolus (1982) investigated three of the defining features of the self-concept construct. The features examined were that (a) self-concept is a multifaceted rather than a single unitary construct; (b) it is hierarchical with general self-concept at the apex followed in descending order by academic self-concept, sub-areas of academic self-concept,

and then specific behaviors; and (c) stability of self-concept increases toward the apex of the hierarchy. The subjects for the study were 99 seventh and eighth grade students from a predominantly white, upper middle-class school district. Their analysis supported the hypotheses that self-concept is multifaceted and arranged hierarchically but failed to find evidence of increasing stability toward the apex. Rather, they found that the stability coefficients for the various levels were all high and roughly equivalent. These coefficients ranged from .56 to .83. This finding was further corroborated by examining the equivalence of factor loadings, variances and covariances among the factors, and error variances for two points in time. Out of five models tested, the model positing equal factor loadings at both points in time provided the best fit to the data, suggesting little or no change in the stabilities of the various measures over a 6-month period.

Shavelson and Bolus (1982) offered two possible explanations for the lack of evidence for increasing stability. First, they suggested that since the lowest levels of the hierarchy, those expected to be least stable, were not measured in the study, a pattern of increasing stability could not be detected. Their second explanation was that the time span between the first and second data collection (6 months) was insufficient to be sensitive to changes in stabilities. An alternative explanation for their finding

concerns the developmental feature of self-concept. Inasmuch as self-concept is believed to become more differentiated with age, the possibility exists that differential stability at the various levels of the hierarchy is, to some extent, dependent on developmental level. Specifically, this raises questions concerning the developmental level of the seventh and eighth grade students studied by Shavelson and Bolus.

There is some evidence to suggest that the self-concepts of persons in this age group are more global in character than differentiated. Mullener and Laird (1971) developed a questionnaire that required subjects to evaluate themselves in five areas. The questionnaire was administered to a group of seventh graders, a group of high school seniors, and a group of evening college students. Measures of individual variation for each of the five areas were computed and compared for the three age groups. The results showed a linear increase in variance scores with age. The authors concluded that the seventh graders tended to evaluate themselves in a more global, undifferentiated manner.

The development of self-concept is one of many variables that have been studied in association with psychological adaptation to the onset of puberty. The empirical work in this area has focused on comparisons between early and late maturers. The onset of puberty, defined as the age at which the person is capable of sexual reproduction, has a very wide range such that deviations from the average

(12.5 years for girls and 14 for boys) are commonplace. In a summary of the literature, Peterson and Taylor (1980) stated that "as a maturational variable, timing of pubertal onset is associated with both persistent psychological effects and other transient effects, which appear to 'wash out' by late adolescence" (p. 143). Whether effects on self-concept are more persistent or transient is not clearly understood. Researchers have found the timing of pubertal onset to be associated with such variables as mood, anxiety, intellectual curiosity, and activity level in boys (Peskin, 1967), and self-confidence and social prestige in girls (Faust, 1960; Jones & Mussen, 1958). Although inconclusive, and often contradictory, these findings warrant cautious interpretation of data bearing on the stability of self-perceptions during early adolescence.

Statement of the Problem

did Shavelson and Bolus (1982) conceded that their study ~~does~~ not provide the strongest possible test for the stability feature of self-concept and suggested that future studies take into account more qualitatively diverse populations. If increasing stability is a function of age, a test of this feature requires a more developmentally diverse population. The present study addressed this problem.

Purpose of the Study

The purpose of the present study was to examine recent claims concerning the self-concept construct. Hypotheses concerning the multifaceted, hierarchical nature of self-concept, and the stability feature of self-concept were tested in a replication of the Shavelson and Bolus (1982) study. The design of the study was extended to include 9th, 10th, 11th, and 12th grade subjects. Additional hypotheses concerning the developmental feature of self-concept were tested through comparisons of three different age groupings.

Hypotheses

The following hypotheses were tested in the present study:

Hypothesis 1: The Multifaceted Feature of Self-Concept

Self-concept in the academic facet, as measured in the present study, is composed of five facets. The hypothesized facets were (a) general self-concept, (b) self-concept of overall academic ability, (c) self-concept of ability in mathematics, (d) self-concept of ability in English, and (e) self-concept of ability in science.

Hypothesis 2: The Hierarchical Feature of Self-Concept

Self-concept is arranged hierarchically such that general self-concept is at the apex of the hierarchy followed in descending order by self-concept of overall academic ability and the three subject-matter specific self-concepts.

Hypothesis 3: Stability of the Structure of Self-Concept

The multifaceted structure of self-concept is stable over a 6-month period.

Hypothesis 4: The Stability Feature of Self-Concept

General self-concept is the most stable facet. Self-concept of overall academic ability is less stable than general self-concept. Subject matter specific self-concepts are least stable.

Hypotheses 5, 6, 7, 8, 9, and 10: The Developmental Feature of Self-Concept

5. The multifaceted feature of self concept (Hypothesis 1) is invariant across grade levels.

6. The hierarchical feature of self concept (Hypothesis 2) is invariant across grade levels.

7. The stability feature of self-concept (Hypothesis 4) is not invariant across grade levels.

8. For the 7th and 8th grade sample all facets of self-concept are highly and equally stable.

9. For the 9th and 10th grade sample the stability of the facets increases toward the apex of the hierarchy.

10. For the 11th and 12th grade sample the stability of the facets increases toward the apex of the hierarchy.

Need for the Study

The present study is needed for two central reasons. The first is the need to provide data bearing on the development of self-structures during adolescence. The

second is the need to further develop the within-construct portion of the nomological network of associations relevant to the self-concept construct.

Clearly, the number of between-construct studies is disproportionate to the number of within-construct studies. This has led to confusion and misinterpretation of the data that are available. Scrutiny of the seven definitional features of self-concept, identified by Shavelson et al. (1976), reveal that these features are, to an extent, interdependent. For example, unless there is clear support for the multifaceted feature of self-concept, it makes little sense to consider a developmental feature that becomes increasingly multifaceted with age. Another example germane to the present study is that unless self-concept can be classified on a dimension of specific to general, it makes little sense to consider a stability feature described as increasing along this dimension. The lack of clarity on these definitional issues severely impedes an understanding of the nature of self-concept and its relationship to other variables of interest. Only when there is sufficient empirical support for the various definitional features can the study of self-concept proceed in a coherent and systematic manner.

Researchers that have examined the stability of self-concept (e.g., Coopersmith, 1967; Marsh, Smith, Barnes, & Butler, 1983; Shavelson & Bolus, 1982) have generally reported that the construct is relatively stable over time.

The other side of stability is change or the developmental feature. The model of self-concept conceptualized by Shavelson et al. (1976) suggests that change in self-concept first occurs in the more specific levels of the various facets and may or may not result in changes at the more general levels. Whether this is in fact the way in which change in self-concept occurs is not known. Furthermore, the extent to which change in self-concept is developmentally-related is not known. It is possible, therefore, that for older, more mature individuals with highly differentiated sets of self-perceptions, self-concept change occurs from the base of the hierarchy upward but that for younger individuals with more global undifferentiated sets of self-perceptions, change is less systematic. Thus, the central reason that the present study is needed is to provide data bearing on the development of these self-structures during adolescence.

In theory, the beginning of the adolescent period is marked by a variety of abrupt changes. Biological theories (Peterson & Taylor, 1980) have noted the rapid physiological changes characteristic of the onset of puberty. Cognitive theories (Piaget, 1969; Kohlberg, 1976) have emphasized the transitions from concrete to formal operational thought and conventional to post-conventional decision-making. According to Erikson (1950), the young adolescent is emerging from a period in which the development of a sense of industry is paramount. If the conflicts of this earlier

period are resolved favorably the young adolescent is equipped with the skills, the competence, and the capacity to work. What the young person does with these skills and capacities is determined, in part, by the resolution of the identity crisis of adolescence. Though highly theoretical in nature, Erikson's writings on the topic of identity have recently stimulated a promising body of empirical work on identity formation in adolescence. In a summary of this research, Marcia (1980) stated that "there are some periods in individuals' lives that are more crucial than others for change in structural form" (p. 60). With regard to the construct definition of self-concept, this statement clearly has implications that need to be explored.

The multifaceted feature of self-concept implies that, given the developmental prerequisites, individuals have self-conceptions in different areas such as academic, physical, social, and emotional. Furthermore, the stability feature implies that changes in these various facet areas are associated with experiences and behaviors in those areas. Ultimately, what research on the developmental issue must address is whether the various facet areas are developing gradually and simultaneously or whether there are concentrated periods during which change in one facet area predominates. The psychosocial link between industry and identity suggests that the time of early adolescence might be a particularly important period in the development of the academic facet of self-concept.

Significance of the Study

Educational researchers have consistently found an empirical relationship between self-concept and academic achievement (Brookover & Erickson, 1969; Coopersmith, 1967; Piers & Harris, 1964; Shavelson & Bolus, 1982). This finding has been the subject of much concern and controversy. A number of experimental studies (e.g., Gray & Klaus, 1970; Logsdon & Ewert, 1973; Reckless & Dinitz, 1972) have attempted to demonstrate that enhancement of students' self-concept will result in achievement gains. The results of these studies have been mixed (Scheirer & Kraut, 1979).

In recent years, self-concept has played a role in the development of innovative educational approaches. For example, Zirkel (1972) pointed out that teachers in the Head Start programs considered enhanced self-concept among disadvantaged students to be a fundamental responsibility, and, according to Rathbone (1971), the development of the affective component of self-concept was influential in developing models of "open education."

These studies and educational approaches have attempted to either improve the self-concepts of students in order to maximize achievement or have valued self-concept improvement as a desirable outcome of educational experiences. The results of these experimental studies and intervention programs are, for the most part, negative. With few exceptions, lasting self-concept changes in predictable directions have not been demonstrated. A sound empirical data

base bearing on the structure and development of self-concept has not been available to guide these efforts in a coherent and consistent manner. The present study provides evidence bearing on the structure and development of self-concept during the adolescent period.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Introduction

The literature on self-concept is vast. The word "self" is used in numerous ways in the psychological literature. Wylie (1974) pointed out that there was considerable interest in the self in early American psychology, particularly in the writings of William James (1896). This interest was short-lived, however. In the early decades of the twentieth century behaviorist and functionalist thought dominated American psychology, and the self, along with other mentalistic constructs, received little attention. Beginning in the early 1940s, interest in the self resurfaced in American psychological writings and theories. This renewed interest has been attributed to several historical factors (Wylie, 1974). Psychologists working in clinical settings were finding behaviorist theories too limiting to account for many of the phenomena they were observing and became increasingly interested in other theoretical viewpoints, notably psychodynamic theories. In his early writings, Freud had placed much emphasis on the role of the id and relatively little on self-constructs. In later writings and revisions, however, ego functions received much

more prominence in Freud's work. At the same time, neo-Freudians were stressing the importance of the ego-ideal and the self-picture. Subsequent writings postulated the real self (Horney, 1950), self-actualization (Maslow, 1954), the phenomenal self (Combs & Soper, 1957), and numerous other self-referents (Wylie, 1974).

Although much has been written about the self and its role in psychology, very little empirical work appeared until 1949 (Wylie, 1974). Subsequent research on self-concept resulted in numerous definitional variations, a multitude of measuring instruments, diverse theoretical perspectives, and contradictory findings. Reviewers of the self-concept literature (e.g., Shavelson et al., 1976; Wylie, 1961, 1974, 1979) have repeatedly emphasized the importance of a sound and consistent methodological approach to this area of study. In their recent review, Shavelson et al. focused their attention on self-concept research in education and provided a framework for the study of self which promises to be useful and productive. These authors addressed problems of definition, measurement, and interpretation and recommended construct validation procedures that may help to draw together the studies in this area. The present study was an effort to further develop the construct definition of self-concept conceptualized by Shavelson et al. by examining empirical evidence in support of several of the definitional features that they identified. The definitional features of interest were (a) the development of

self-concept, (b) the stability of self-concept, (c) the multifaceted nature of self-concept, and (d) the hierarchical arrangement of self-concept. Literature concerning these four definitional features of self-concept is reviewed in this chapter.

The Developmental Feature of Self-Concept

The hypothesis that self-concept becomes more differentiated with age is strongly supported in the theoretical literature on human development. Cognitive growth is frequently described as the on-going process of achieving finer degrees of differentiation. For example, Piaget (1962) pointed out that actions are the building blocks for what will later become internalized thought. This occurs through a process of progressive differentiation between the infant's actions and what the actions signify. Once the child becomes capable of internalized thought another form of differentiation becomes necessary. This process is described by Piaget in terms of the child's early egocentrism or the "failure to differentiate between the ego and the group, or the confusion of the individual viewpoint with that of others" (p. 290). In each of Piaget's stages of cognitive development, change occurs through progressive differentiation. Although the content of thought and cognition changes with age, the process of differentiation continues to occur and facilitate development.

The notion of progressively differentiated cognitive entities also plays an important role in the developmental theory of Werner (1948, 1957). According to Werner, various cognitive entities, such as thought, perception, and emotion, are undifferentiated in early life. Through development they come to be experienced as distinct and different and eventually related to one another in a hierarchically integrated fashion.

A third theory that relies heavily on the concept of increased differentiation with experience is the perceptual theory of Gibson (1969). Gibson's definition of perceptual development closely parallels the cognitive theories of Piaget and Werner:

This definition implies that there are potential variables of stimuli that are not differentiated within the mass of impinging stimulation, but which may be, given the proper conditions of exposure and practice. As they are differentiated, the resulting perceptions become more specific with respect to stimulation, that is, in greater correspondence with it. . . . The criterion of perceptual learning is thus an increase in specificity. (p. 77)

Applied to the development of self-concept, these theoretical viewpoints suggest that the self-concept, broadly conceived as one's perceptions of oneself, is a cognitive structure that becomes increasingly differentiated with age, experience, and maturity. Sarbin (1959) summarized these points:

1. Behavior is organized around cognitive structures. . . . The self is one such cognitive structure or inference.
2. The self is empirically derived. . . . It is the resultant of experience.

3. The self (in common with other cognitive structures) is subject to continual and progressive change, usually in the direction from lower-order inferences about simple perceptions to higher-order inferences about complex cognitions. (p. 12)

One of the few studies that have attempted to directly test the hypothesis that self-concept becomes increasingly differentiated with age was conducted by Katz and Zigler (1967). In order to test their major hypothesis concerning real and ideal self-image disparity, Katz and Zigler first tested the subsidiary hypothesis that the higher the individual's developmental level (as measured by age and IQ), the greater the degree of cognitive differentiation in report of self-image. These authors reasoned that a low level of cognitive differentiation would be indicated by a high frequency of extreme responses to several different measures. In other words, subjects with little differentiation in self-concept were expected to rate themselves very high in most areas or very low in most areas. A high level of cognitive differentiation, on the other hand, would be indicated by a more balanced response tendency such that subjects with a higher differentiated self-concept were expected to rate themselves high in some areas and low in others and choose moderate as well as extreme responses. Three questionnaires were developed to assess real self-image, ideal self-image, and social self-image and were administered to 120 children in 5th, 8th, and 11th grade classes. These questionnaires had six response categories, ranging from "very true" to "very untrue." The findings

generally supported the cognitive differentiation hypothesis. Extreme responses were most frequent among the youngest age group and decreased among the older subjects. High-IQ subjects were also found to make fewer extreme responses than low-IQ subjects. The only exception to this general pattern was the finding that high-IQ males tended to make more frequent extreme responses than low-IQ males on the measure of ideal self-image. The authors suggested that this exception might be due to higher levels of aspiration among these subjects. However, the overall negative relationship between frequency of extreme responses and both age and IQ is strongly suggestive of a more differentiated self-concept at higher levels of cognitive development.

Further support for increased differentiation with age was provided by Mullener and Laird (1971). These authors developed a 40-item questionnaire that required subjects to evaluate themselves in five different areas. The content areas included were achievement traits, intellectual skills, interpersonal skills, physical skills, and social responsibility. The response format was identical to that of Katz and Zigler's questionnaire. The instrument was administered to a group of seventh graders, a group of high school seniors, and a group of evening college students. Measures of variation for each of the five areas were compared for the three age groups. The results showed a linear increase in variance scores with age, suggesting that older subjects were more likely to rate themselves differentially in the

various content areas than were the younger subjects. The age groups were comparable with respect to IQ, and no sex differences were found. These findings offer strong support for the contention that younger subjects tend to evaluate themselves in a more global undifferentiated manner, whereas older subjects evaluate themselves as high in some areas and low in others.

Indirect support for increased differentiation with age was reported in a number of self-concept and self-reference studies. For example, in the academic facet of self-concept, O'Malley and Backman (1979) reported that success in school becomes less central to self-concept toward the end of high school. This could be suggestive of a more differentiated organization of self-perceptions at this age. In the social facet of self-concept, Long, Henderson, and Ziller (1967) reported that the tendency for subjects to represent themselves as "different" increased with grade level. Jersild (1952) derived 18 categories of self-evaluation from compositions written by approximately 2,800 students, ranging from fourth grade to college level. In this study it was found that younger subjects made more frequent reference to physical characteristics in their self-descriptions, whereas older subjects made more frequent reference to internal resources and interpersonal relationships.

Finally, Epstein (1973) maintained that the self-concept is essentially a theory that each individual holds

about him or herself. The individual's self-theory can be either a good or a poor theory. Epstein applied the same evaluation criteria to individual self-theories as would apply to any theory and, in regard to differentiation, concluded that "good theories are expansive. They become more differentiated and extensive as additional data are made available. Poor theories are not only restricted, they are restrictive" (p. 408). Self-theories may remain undifferentiated and restricted for at least three reasons, according to Epstein. The individual lacks the cognitive capacity for increased differentiation or is limited in experience. Both of these reasons have clear developmental implications. The third reason for maintaining a restricted self-theory is that the individual feels highly threatened.

In conclusion, there is wide support in theoretical writings for a developmental feature of self-concept. This feature is characterized by increased differentiation with age and maturity. An increased ability to make finer distinctions with higher levels of development is a feature common to the cognitive theories of Piaget (1962) and Werner (1948, 1957) and to Gibson's (1969) theory of perceptual development. Both Sarbin (1959) and Epstein (1973) have applied this feature more specifically to cognitions and perceptions in relation to self. The empirical work on the developmental feature of self-concept is generally supportive of increased differentiation with age. The studies that have provided empirical evidence for this (Katz &

Zigler, 1967; Mullener & Laird, 1971) have concluded that self-concept is characteristically global and undifferentiated among younger children and becomes increasingly differentiated and articulated as the child matures.

The Hierarchical Feature of Self-Concept

The hierarchical feature of self-concept is implied in the previous section indirectly by Sarbin (1959) and more directly by Werner (1948, 1957). In describing the developmental changes in self-concept, Sarbin referred to lower-order and higher-order inferences, suggesting different levels of cognitions and self-perceptions. Werner's developmental theory describes an on-going process of differentiation and hierarchical integration. According to Werner, as thought, emotion, and perception become increasingly differentiated, they come to be related to one another in a hierarchical arrangement. Cognitive entities lower in the hierarchy are subordinated to those above them.

Shavelson et al. also described the self-concept as arranged hierarchically on the dimension of generality. The hierarchical structure of self-concept described by Shavelson et al. is composed of a general self-concept at the apex of the hierarchy. At the next lower level of the hierarchy, general self-concept is divided into the two major components of academic self-concept and nonacademic self-concept. Nonacademic self-concept could be further divided into subject-matter specific self-concepts; physical

self-concept could be further divided into sport-specific self-concepts, such as perceptions of abilities in team sports and individual sports. At the very base of the hierarchy, self-concept is conceptualized as situation-specific.

To test the hierarchical feature of self-concept, Shavelson and Bolus (1982) administered a battery of self-concept instruments to a sample of junior high school students. The test battery consisted of two measures of general self-concept, two measures of overall academic self-concept, and two measures each of subject-matter specific self-concept in English, mathematics, and science. The test battery was administered to the sample at two points in time approximately 6 months apart. The data analysis also included grades in English, mathematics, and science at the times of the two data collections. In order to test the hypothesis that self-concept is structured hierarchically, the authors compared several competing models. One model proposed that self-concept was a single global factor underlying all of the observed self-concept measures. This model was compared to a two-factor model, a five-factor model, and a null model in a goodness of fit test. The results showed that the five-factor model provided the best fit to the data. The interpretation that self-concept is hierarchically arranged was further supported by the pattern of correlations among the self-concept measures. As hypothesized, general self-concept correlated

most highly with overall academic self-concept, next highest with subject-matter specific self-concept, and next highest with grades in specific subjects. This pattern of correlations appeared for the first data collection and was replicated in the second data collection, thus supporting the hierarchical interpretation.

Using factor analytic techniques Marsh, Smith, Barnes, and Butler (1983) also examined the hierarchical structure of self-concept. The instrument used in the study was the Self-Description Questionnaire (SDQ) developed by Marsh, Smith and, Barnes (1983). The conceptual model proposed by Shavelson et al. (1976) provided the theoretical basis for the development of the SDQ, which was designed to measure seven areas of self-concept including four nonacademic areas--physical abilities, physical attractiveness, relationships with peers, and relationships with parents--and three academic areas--ability and interest in reading, in mathematics, and in all school subjects. The SDQ was administered to samples of fourth, fifth, and sixth graders at two points in time 6 months apart. Teacher ratings of students on these seven areas of self-concept were also obtained. Marsh et al. first conducted a series of exploratory factor analyses for each data collection separately. A two-factor solution supported the academic and nonacademic separation for both the student self-ratings and the teacher ratings. All three of the academic subscales had substantial loadings on the academic factor, and three of the

four nonacademic subscales had substantial loadings on the nonacademic factor. The subscale designed to assess relationships with parents had moderate loadings on both the academic and nonacademic factors.

Following this analysis, the seven student self-ratings for each data collection were combined and examined in a single factor analysis using a four-factor solution. The four-factor solution was used because the first analysis had resulted in four eigenvalues greater than 1.0. Teacher ratings on the seven self-concept areas were also analyzed with a four-factor solution. This analysis resulted in four higher order factors. The first factor was labeled Nonacademic Self-Concept and was defined by ratings on physical abilities, physical attractiveness and relationships with peers. Two separate academic factors were identified and labeled as Verbal-Academic Self-Concept and Quantitative-Academic Self-Concept. The verbal factor was defined by ratings in reading and all school subjects, and the quantitative factor was defined by ratings in mathematics and all school subjects. The fourth factor found was labeled Relationships with Parents and was defined by ratings in this area at the first and second data collection. It was concluded from these analyses that there was support for the hierarchical structure of self-concept, though a somewhat more complicated hierarchical structure than that proposed by Shavelson et al. (1976).

In summary, the hierarchical feature of self-concept is implied by a number of theorists, including Werner (1948, 1957) and Sarbin (1959). Shavelson et al. (1976) described the hierarchical structure of self-concept, and Shavelson and Bolus (1982) found empirical support for the hierarchical structures in a study using multiple measures of self-concept with a junior high school sample. Marsh, Smith, Barnes, and Butler (1983) reported additional support for the hierarchical structure of self-concept but concluded that this structure may be more complex than originally suggested.

The Multifaceted Feature of Self-Concept

Among the definitional problems associated with the self-concept is the determination of whether it is a single unitary construct or one that is made up of multiple facets. Much of the early research literature on self-concept proceeded on the assumption that it is a single unitary construct without providing a test of this assumption (Wylie, 1974). Writing in regard to an academic facet of self-concept, Brookover and Erickson (1969) noted that self-concept is frequently referred to in a trait-like manner, much like red hair or brown eyes might be. In recent years a number of studies (Fernandez, Michael & Smith, 1978; Fleming & Watts, 1980; Marx & Winne, 1978; Michael, Smith & Michael, 1975; Shavelson & Bolus, 1982; Winne, Marx & Taylor, 1977) have attempted to determine whether

self-concept is a single unitary construct or a multifaceted construct. Most of these studies have used factor analytic techniques, although several based their conclusions on the analyses of multitrait-multimethod matrices. Multitrait-multimethod analysis is an approach to determining construct validity appropriate when two or more traits are being measured by two or more methods. Construct interpretations of measures, as well as subscale interpretations, are valid when criteria for convergent and discriminant validity are met (Campbell & Fiske, 1959; Shavelson et al., 1976). The criterion for convergent validity is met when correlations between different measures of the same construct are significantly greater than zero and are of practical value. The criteria for discriminant validity are met when (a) the correlations between two measures of the same construct are greater than the correlations between different measures of different constructs (heterotrait-heteromethod matrix entries), (b) the correlations between two measures of the same construct are greater than the correlations between different constructs measured with the same method (heterotrait-monomethod matrix entries), and (c) the same pattern of interrelationships among constructs are obtained with the same or different measurement methods.

One study designed to explore the dimensionality of self-concept was conducted by Fernandez, Michael, and Smith (1978). Three parallel forms of the Dimensions of Self-Concept (DOSC) Scale (Michael & Smith, 1976), an instrument

designed for use with three different age groups to assess five school related self-concept dimensions--aspirations, anxiety, academic interest and satisfaction, leadership and initiative, and identification vs. alienation--were administered to samples of 4th through 6th graders, 7th through 9th graders, and 10th through 12th graders. The purposes of the study were to determine the empirical factor structures of each form, to see whether the empirical factor structures corresponded to the a priori dimensions of the scales, and to determine whether any of the factors identified were invariant across grade levels. To answer these questions the scale items were factor analyzed followed by oblique and orthogonal solutions. The findings of this study offer support for a multifaceted interpretation of self-concept. The orthogonal solution yielded two factors for the youngest age group sampled, three factors for the middle age group, and three factors for the oldest age group. The oblique solution yielded one, four, and three factors respectively for the age groupings sampled. Although the results of the factor analysis suggest multiple facets, only modest congruence was found between the empirical factor structures and the a priori dimensions. Only one factor, anxiety, was found to be invariant across grade levels.

A study conducted by Fleming and Watts (1980) supported the multifaceted interpretation of self-concept among college students. Fleming and Watts administered a modified version of the Feelings of Inadequacy Scale (FIS), first

developed by Janis and Field (1959), to a group of college students along with a series of personality measures. A principal components analysis of the FIS yielded three distinct groupings of items labeled social confidence, school abilities, and self-regard. This finding, along with the pattern of correlations between the factors and other personality variables, offers further support for a multi-dimensional interpretation of self-concept.

Among the more widely used measures of self-concept is the Coopersmith (1967) Self-Esteem Inventory (SEI). The SEI is used primarily as a measure of general self-concept in studies examining the relationship of self-concept to other constructs. Although Coopersmith's own work does not provide any empirical evidence warranting separate subscale interpretations of the SEI, he did propose four a priori subscales. Using a multitrait-multimethod design, Dyer (1964) examined the validity of the subscales proposed by Coopersmith. Separate subscale interpretations would be warranted if the criteria for convergent validity and discriminant validity were met. As an alternate measure, Dyer used an attitude questionnaire with a semantic differential. On a sample of 500 public school children, Dyer reported that the convergent validity criterion was met, but that there was limited support for discriminant validity. He concluded that there was insufficient evidence for separate interpretable subscales.

Kokenes (1974) further examined the subscales proposed by Coopersmith in a factor analysis of the SEI scores of 7,600 public school students. A high correspondence was found between the four a priori subscales proposed by Coopersmith and four pairs of bipolar factors that emerged from Kokenes's analysis. Coopersmith's proposed subscales and the bipolar factors from the Kokenes study centered around the areas of school and academics, peers, home and family, and general self. Of the 50 SEI items (the 8-item lie scale was omitted from the analysis), only 6 items failed to load on the corresponding factors to which Coopersmith had assigned them, suggesting a fairly high degree of congruence between the a priori scales and the empirical factors. Kokenes found little factorial difference from grade level to grade level as well as few sex differences. The high degree of congruence between the empirical factors in Kokenes's study and the conceptual factors proposed by Coopersmith suggests that separate subscale interpretations of the SEI might be warranted and provides additional support for the multifaceted feature of self-concept.

Another measure that has been widely used in self-concept research is the Way I Feel About Myself (WIFM) Scale developed by Piers and Harris (1964). Piers and Harris generated an original item pool of simple declarative statements from Jersild's (1952) collection of student compositions. The empirical structure of the scale was

examined by administering it to 457 sixth grade students and conducting a factor analysis. A principal components analysis yielded 10 factors, 6 of which were considered large enough to be interpretable. These factors were labeled behavior, general and academic status, physical appearance and attributes, anxiety, popularity, and happiness and satisfaction. These findings are suggestive of a multifaceted construct definition of self-concept.

A study designed, in part, to see if the Piers and Harris (1964) factors could be replicated was also supportive of the multifaceted feature of self-concept. Michael, Smith and Michael (1975) sampled elementary school students, junior high school students, and senior high students. From this total sample of 901 students, 3 of the 6 interpretable factors identified by Piers and Harris were replicated. These factors were physical appearance, socially acceptable behavior, and academic or school status. In addition, these three factors were found to be essentially invariant across the three age groupings sampled.

The studies reviewed thus far provide considerable empirical support for the view that self-concept is a multifaceted construct. The exception to this is Dyer's (1964) failure to find evidence of discriminant validity in a multitrait-multimethod analysis. A similar lack of evidence for discriminant validity was reported by Winne, Marx, and Taylor (1977) and Marx and Winne (1978). These studies used identical methods and procedures with two different

samples. The Winne, Marx, and Taylor study was done with a sample of third through sixth graders. The Marx and Winne study was conducted with a larger sample of sixth graders. In both studies three self-concept measures were administered. These were the Gordon (1966) How I See Myself Scale, the Piers and Harris (1964) Way I Feel About Myself Scale, and the Sears and Sherman (1964) Self-Concept Inventory. These scales were chosen because each purportedly measured the physical, social, and academic facets of self-concept. The correlations were corrected for attenuation and entered into a multitrait-multimethod matrix. The authors concluded that the three facets of physical, social, and academic self-concept were not empirically differentiable from one another. There was some evidence of convergent validity but not of discriminant validity. The multifaceted feature of self-concept was therefore not supported in these studies.

Shavelson and Bolus (1982) criticized the studies of Marx and Winne (1978) and Winne et al. (1977) on three points. First, they pointed out that interpretation of the subscales from these three instruments was based on subjective categorization rather than firm empirical evidence. Thus, the interpretability of the subscales of these instruments is questionable. Second, they noted that a multitrait-multimethod analysis requires the use of at least two clearly different methods. Marx and Winne and Winne et al. reasoned that the three different response formats of the three instruments constituted different methods.

Shavelson and Bolus disagreed with this reasoning pointing out that the use of three self-report instruments would result in high method covariation and difficulty in differentiating the subscales. The third criticism was that the assumption necessary for corrections for attenuation (strictly parallel tests) was not met resulting in spuriously high correlations. To demonstrate their point, Shavelson and Bolus used the reported reliabilities in the Marx and Winne study to disattenuate the correlations and reconstructed a multitrait-multimethod matrix on the basis of the disattenuated correlations. From the reconstructed matrix, Shavelson and Bolus argued that the Marx and Winne data had met the criteria for discriminant validity and did in fact support the multifaceted feature of self-concept.

Shavelson and Bolus (1982) provided further support for the multifaceted feature of self-concept in their own data analysis. As described in the previous section, Shavelson and Bolus obtained two measures each of general self-concept, overall academic self-concept, and self-concepts of abilities in English, mathematics, and science from a sample of junior high school students at two points in time 6 months apart. Several sources of support for the multifaceted feature of self-concept were described. An analysis of the correlations between measures revealed that the criteria for both convergent and discriminant validity were met, thus supporting separate interpretations of multiple facets. In addition, an analysis of covariance

structures was conducted. This analysis involved testing several competing models in a goodness of fit test. The results showed that the preferred five-factor model positing general, overall academic, and three subject-matter specific self-concepts provided the best fit to the data accounting for 80% of the covariation. This finding was replicated in an analysis of the results from the second data collection.

Finally, support for the multifaceted feature of self-concept was provided by Marsh, Smith, Barnes, and Butler (1983). Marsh et al. examined measures of the self-concepts of fourth, fifth, and sixth grade subjects in a multitrait-multimethod analysis. Matrix entries consisted of correlations between seven areas of self-concept assessed by the Self-Description Questionnaire (SDQ), teacher ratings of students in the seven areas, and data collections at two points in time 6 months apart. Marsh et al. thus described the analysis in terms of a multitrait-multimethod-multitime matrix. The distinctiveness of the seven self-concept areas was examined by applying the criteria for convergent and discriminant validity to student self-ratings, teacher ratings of students, and agreement between student and teacher ratings. All criteria for convergent and discriminant validity were met for both student self-ratings and teacher ratings; however, there was some lack of support for discriminant validity in the area of student and teacher agreement. Specifically, one of the criteria for discriminant validity required that correlations between

students' self-ratings and teacher ratings be greater than both the correlations among student ratings across different traits, and teacher ratings across different traits. This criterion was often not met. Marsh et al. argued that failure to meet this criterion was due to true covariation among the factors rather than method bias and concluded that there was substantial support for the multifaceted feature of self-concept.

In conclusion, most of the research that has systematically examined the multifaceted feature of self-concept has been supportive. The exceptions to this general support are studies by Marx and Winne (1978) and Winne, Marx, and Taylor (1977). Both of these studies failed to find support for the multifaceted feature of self-concept. However, Shavelson and Bolus (1982) pointed out several problems in the design of the two studies, reanalyzed the data from the Marx and Winne study, and found support for the multifaceted nature of self-concept.

The Stability Feature of Self-Concept

The stability of self-concept is related to several other features of the construct. Research on the developmental feature of self-concept has suggested that stability may, to some extent, be a function of age. The general support reported for the multifaceted feature of self-concept raises questions concerning differential stability among facets. Finally, the hierarchical feature of

self-concept, as described by Shavelson et al. (1976), implies that stability varies by hierarchical level.

This section reviews several studies concerning the stability of self-concept. Although most of the studies contained in this section are primarily investigations of stability, they have little else in common. The methods, procedures, and methods employed are diverse. For this reason little effort is made to compare the studies' findings.

Difficulty in the assessment of self-concept is exacerbated when sampling very young children. Reliable self-ratings on self-report instruments have been reported for subjects as young as third grade (Piers & Harris, 1964), but few paper-and pencil tests are available for children below this age group. Most early childhood studies in this area have explored variables such as self-recognition (Lewis & Brooks, 1974), self-definition (Halliday, 1975), and locus of self (Flavell, Shipstead & Croft, 1978). One longitudinal study that attempted to assess stability of self-concept in early childhood was conducted by Trickett (1969). Trickett's sample consisted of 42 first and second graders, with a second data collection when the children were in fifth and sixth grade. For the first and second graders self-concept was assessed through individual interviews. The children were also rated by peers and teachers on several variables. When the children were in fifth and sixth grade, self-concept was assessed by group administered paper-and-pencil inventories. Again the children were

rated by peers and teachers. Trickett reported that none of the self-concept variables were stable over the 4-year period but that certain peer and teacher ratings were predictive of later self-concept. The major implication of Trickett's results is that as early as first and second grade it is unlikely that children have formulated a stable concept of self or at least not one that they are able to articulate.

There is some evidence that by fourth or fifth grade self-concept does become relatively stable. Marsh, Smith, Barnes, and Butler (1983) examined the stability of seven areas of self-concept among fourth, fifth, and sixth graders over a 6-month period. This study examined both the stability of students' self-reports and the stability of teachers' ratings of the students. Student self-reports were found to be internally consistent and stable over time. The mean stability coefficient for the seven areas of self-concept was .61. Teacher ratings of students were also found to be internally consistent and highly stable over time with a mean stability coefficient of .71 for the seven self-concept areas studied.

Coopersmith (1967) reported a test-retest reliability for the SEI of .88 for a group of 30 fifth graders after a 5-week period. More impressive in regard to stability over time is a reported test-retest reliability coefficient of .70 for the same group of fifth graders retested in eighth grade. Coopersmith concluded that "this would suggest that

at some time preceding middle childhood the individual arrives at a general appraisal of his [or her] worth, which remains relatively stable and enduring over a period of several years" (p. 5).

A number of interesting findings regarding the stability of self-concept in adolescence was provided by Engel (1959). Engel used a paper-and-pencil Q-sort technique as a measure of self-concept. Subjects for the study were 8th and 10th graders whose self-concept was assessed again when they were 10th and 12th graders. The overall mean correlation for all subjects was .53 (corrected for attenuation, .78). This relatively stable measure of self-concept was in accordance with the author's expectations. In order to understand better the nature of the changes that did occur, subjects were categorized on the basis of their first self-concept score into one of three categories: positive self-concept, negative self-concept, and defensive positive self-concept (as measured by the K Scale of the MMPI). On the basis of these classifications, it was reported that subjects with positive and defensive positive self-concepts were equally stable over time, and both were more stable than subjects in the negative self-concept group. The mean level of self-concept for the overall sample shifted toward the positive with the passage of time; however, this was due to the negative self-concept group shifting toward the mean with no similar shift among the positive self-concept group. Those who maintained their negative self-concept over the

2-year period were less well adjusted (as measured by Scales Pd and D of the MMPI). Finally, there was no difference in stability between the sexes or age groups.

Brownfain (1952), like Engel, examined the relationship between stability and adjustment. Brownfain's sample consisted of 62 male college students, ranging from sophomore to graduate level, who lived together in a housing co-op. The subjects were instructed to rate themselves on 25 attributes (e.g., self-acceptance, cheerfulness) in four ways. These were (a) a private self-rating, expected to be the most accurate self-rating; (b) a positive self-rating, in which the subjects were to give themselves the benefit of the doubt in any situation; (c) a negative self-rating, described as the fear of who they think they really are; (d) a social self-rating, or how they believe others see them. Each rating was on a 0 to 9 scale. Stability was defined as the difference between the positive and negative self-rating summed over all items. An unstable self-concept was inferred from a large discrepancy score, and a stable self-concept was inferred from a low discrepancy score. The subjects were rank ordered according to their stability scores. The 15 most stable and 15 least stable subjects were used as comparison groups. Brownfain's major hypothesis was that the group of subjects identified as having the most stable self-concepts were also the happiest and most adequate group members. As a measure of how well the individual got along in the social environment, the

Guilford-Martin Inventory of factors (GAMIN) was administered along with group evaluations of each subject on 10 variables. The stable subjects were found to have higher overall self-ratings than the unstable subjects. On the basis of the GAMIN scores, the stable subjects were more ascendent, more masculine, and less afflicted by feelings of inferiority and nervousness. Stable subjects were also rated more highly by the group on 7 of the 10 variables and were better able to predict how the group would evaluate them.

A study that approximates the hierarchical conceptualization of self-concept was conducted by Ludwig and Maehr (1967) and provides some information on the stability of self-concept in the physical facet. Ludwig and Maehr's sample consisted of 65 male junior high school students. The study was experimental in nature and included a series of measures taken one week prior to treatment, immediately following treatment, one week after treatment, and three weeks after treatment. The measures used were a semantic differential as a measure of general self-concept, the Mayer-Haas Physical Self Test, and a behavioral choice questionnaire on which subjects noted their performance on a variety of physical and non-physical activities. The treatment phase of the study involved assigning subjects to either an approval group, a disapproval group, or a control group. All subjects were asked to perform a variety of physical tasks while being observed by a "physical

development expert." Following task performance, the expert responded to each subject according to group assignment regardless of level of performance. Thus, subjects' performance was responded to with approval, disapproval, or no evaluation. The experimenters hypothesized that when the subjects' performance was responded to with approval or disapproval from an expert, changes in related areas of self-concept would also occur. This hypothesis concerning consonant changes in self-concept was supported as well as a number of subsidiary hypotheses predicting the direction of change. Approval or disapproval from an expert resulted in like changes in self-concept and reported behavioral preferences. The authors reported that posttreatment changes in self-concept "reached but did not pervade the area of general self-regard" (p. 460). Ludwig and Maehr's results offer some support for the Shavelson et al. (1976) description of the stability of self-concept. Changes that did occur appeared to be at the behavioral level and closely related areas. General self-concept was more stable and did not change as a result of treatments of this magnitude.

The most relevant study of the stability of self-concept is the Shavelson and Bolus (1982) study referred to earlier. These authors measured self-concept at several hierarchical levels in the academic facet of self-concept. Measures were taken of a junior high school sample at two points in time 6 months apart. The authors expected to find general self-concept to be highly stable, academic

self-concept to be somewhat less stable and subject-matter specific self-concept to be least stable. The findings did not support this expectation. Instead, all of the self-concept measures were highly and equally stable. The authors offered two possible explanations for this result. These were that the 6 month time period was not long enough to be sensitive to differences in stabilities and that the lowest levels of the hierarchy, hypothesized to be least stable, were not measured. These explanations are plausible; however, a third explanation is equally plausible. This explanation is that the self-assessments made in the academic facet by subjects in this age group are not yet sufficiently differentiated from other areas of self-concept to result in differential stabilities. A pattern of stability such that general self-concept is highly stable, academic self-concept is somewhat less stable, and subject-matter specific self-concepts are least stable may be evident only for older age groups.

In summary, studies pertaining to the stability of self-concept appear to warrant several tentative conclusions. The findings of Trickett (1969), Marsh, Smith, Barnes, and Butler (1983), and Coopersmith (1967) suggest that a general and relatively stable self-concept is formulated roughly at the age level of fourth or fifth grade. Some evidence that this general self-concept maintains a relatively high degree of stability through the high school years was provided by Engel (1959). In addition, Engel's

findings suggest that positive self-concepts are more likely to be stable than negative self-concepts. Brownfain (1952) found the same to be true among college students.

Finally, the evidence regarding the hypothesis that the stability of self-concept decreases from the general to the specific levels of the hierarchy is inconclusive. Ludwig and Maehr (1967) provided support for the hypothesis for the physical facet of self-concept; however, Shavelson and Bolus (1982) failed to find evidence of decreasing stability in the academic facet of self-concept.

Summary and Implications for the Present Study

The studies reviewed in the previous four sections, more often than not, lend support to the definitional features that they addressed. This is most apparent in regard to the multifaceted feature of self-concept. When factor analyzed or studied in multitrait-multimethod designs, most of the self-concept instruments studied appear to be measuring multiple facets. There is far less agreement on what the specific facets are, and many of the instruments continue to be used primarily as measures of general self-concept.

The developmental feature of self-concept has a strong theoretical base and an inconclusive, but generally supportive, empirical base. The strongest support for this

feature comes from two cross-sectional studies using different measures and different analysis strategies (Katz & Zigler, 1967; Mullener & Laird, 1971).

Less is known about the hierarchical feature of self-concept. However, the two studies that address this feature (Marsh, Smith, Barnes & Butler, 1983; Shavelson & Bolus, 1982) both found empirical support for it.

A very general picture emerges from the literature on the stability of self-concept, suggesting that in the early grade school years general self-concept becomes relatively stable and remains so. Few studies in this area examine self-concept in specific facets and at different levels. Among the few that do (Ludwig & Maehr, 1967; Shavelson & Bolus, 1982), mixed findings are reported.

Each of the studies reviewed here has contributed to the theoretical framework upon which the present study is based. As a whole, however, the body of literature on self-concept is difficult to interpret. The diversity of methodologies, in and of itself, is not sufficient grounds for criticism but precludes certain comparisons across studies. Of greater concern is the quality of the methodologies employed. In some instances the ability to interpret data, draw sound conclusions, and generalize findings is seriously impeded. Although many serious methodological problems were minimized in the studies reviewed here, several persist, making interpretation difficult.

Two problems, concerning instrumentation and replication, are discussed below.

The most apparent problem leading to misinterpretation of results is the proliferation of self-concept instruments. Of particular concern are the many instruments that were developed for a single study and never used again. Frequently, authors of these instruments reported estimates of reliability, but they seldom addressed validity concerns. Therefore, there is little to suggest that the instruments are in fact measuring self-concept. It is incumbent upon the authors of self-concept instruments to demonstrate that the instrument possesses construct validity. Because establishing construct validity is an on-going process, this problem is most evident in studies that develop and use an instrument just once.

A second problem that is evident in the present literature review is the conspicuous absence of replication studies. As long as the studies remain unreplicated, there is the likelihood that some statistically significant findings are due to chance and cannot be replicated. When null findings are reported and never replicated, they are uninterpretable. Campbell (1957) argued against the exact replication of studies. Campbell pointed out that when a study is replicated exactly, certain artifacts that are exerting some unknown influence continue to have a confounding effect on the variables under study and the observational procedures being used. However, when studies go

unreplicated, the result is a group of heterogeneous one-shot studies. As noted above, an attempt to synthesize, compare, and interpret such a body of literature can be confusing and misleading. Campbell recommended "transitional" studies. In a transitional study, the author employs a multiple design in which one segment is a replication of an earlier study. In addition, the study is designed in such a way that the relevant aspects of the confounded variables or procedural techniques are dealt with in some way.

The present study was one such transitional study. The study being replicated was conducted by Shavelson and Bolus (1982) and required testing a sample of seventh and eighth grade subjects using two measures of general self-concept, two measures of overall academic self-concept, and two measures each of subject-matter specific self-concept in mathematics, English, and science. All subjects were tested at two points in time 6 months apart. In keeping with the Shavelson and Bolus study, hypotheses concerning the multifaceted, hierarchical nature of self-concept, and the stability feature of self-concept were tested using the same methods and procedures employed by Shavelson and Bolus. The present study further extended the Shavelson and Bolus design by applying the same procedures to samples of 9th, 10th, 11th, and 12th grade subjects. By extending the study in this manner the developmental feature of self-concept was taken into consideration. Finally, because the present

study made use of the same measuring instruments used in the Shavelson and Bolus study, all of which have histories of construct validity, problems related to the use of one-shot instruments were eliminated. Chapter III provides a description of the sampling procedures, a review of the instruments used, and a description of the analysis strategies and procedures employed.

CHAPTER III

RESEARCH METHODOLOGY

Introduction

The present study is a replication of a previous study conducted by Shavelson and Bolus (1982). The study conducted by Shavelson and Bolus examined three hierarchical levels of the academic area of self-concept from a sample of seventh and eighth grade students. The sample were administered a battery of self-concept instruments at two points in time 6 months apart. The test battery included the Tennessee Self-Concept Scale, the Piers and Harris Way I Feel About Myself Scale, and split halves of forms A and B of the Michigan State Self-Concept of Ability Scale. The present study replicated these procedures with a sample of seventh and eighth grade students, a sample of ninth and tenth grade students, and a sample of eleventh and twelfth grade students.

In the present study, both a measurement model and a structural model were examined. The measurement model specifies the expected relationships between the individual measures contained in the test battery and the latent constructs that the measures were designed to assess. The structural model specifies the hypothesized relationships

between the latent constructs. Multiple measures of each construct were used in order to argue for the validity of the construct interpretations and to estimate the relationships between the latent constructs rather than the observed measures containing measurement error (Shavelson & Bolus, 1982).

This chapter provides a description of the research participants and the procedures used to collect the data, a review of the measures used, and a description of how the data were analyzed.

Sample and Procedures

Selection of Research Participants

Permission to conduct the study was first obtained through the local school board of a public school district in north central Florida. The principals of a middle school and a high school in the district then consented to the use of their schools to obtain participants for the study. Classes taught by one teacher at each grade level were targeted for participation. In early October of 1983, all of the students in the selected classes were provided with parental permission forms (See Appendix A) and asked to obtain permission from their parents or guardians to participate in the study. Only those students who had obtained written permission were permitted to participate.

Procedures for Administration

During the last week of October, 1983, the self-concept test battery (see Instrumentation) was administered to each class by the author during a regularly scheduled 50-minute class period. Each class was read a set of standardized instructions for each of the measures (see Appendix B). During the first week of May, 1984, the same subjects completed the test battery a second time. Although the subjects were guaranteed anonymity on the parental consent form, subjects' names were obtained in order to match and code responses from the first and second data collections. The identification of respondents was discarded following the second data collection.

Research Participants

The original sample at the time of the first data collection consisted of 187 7th and 8th grade students, 234 9th and 10th grade students, and 180 11th and 12th grade students. Research participants were lost due to school transfers between the first and second data collection, absences during one of the two data collections, and incomplete data at either of the two data collections. The total loss of research participants was 29%, which is comparable to the 35% loss reported by Shavelson and Bolus. The final sample included in the data analysis consisted of 144 7th and 8th grade students, 162 9th and 10th grade students, and 122 11th and 12th grade students. The total sample was made

up of 48.6% males and 51.4% females, and 85% white and 15% non-white students. The age range for the 7th and 8th grade students was from 12 years to 15 years and 1 month, with a mean age of 13 years. The 9th and 10th grade students ranged in age from 14 years, 3 months to 18 years, 3 months, with a mean age of 15 years and 7 months. The age range for the 11th and 12th grade students was 16 years to 18 years and 6 months, with a mean age of 17 years and 3 months.

Instrumentation

Self-concept was measured at three levels of the hypothesized hierarchy: general self-concept, overall academic self-concept, and subject-matter specific self-concept. General self-concept was measured with the Tennessee Self-Concept Scale (Fitts, 1965) and the Way I Feel About Myself Scale (Piers & Harris, 1964). Overall academic self-concept was measured with Form A of the Michigan State Self-Concept of Ability Scale (Brookover, LePere, Hamachek, Thomas & Erickson, 1965). Form A was divided into halves of odd and even numbered items to provide two measures of overall academic self-concept. Form B of the same scale was used to measure subject-matter specific self-concept in English, mathematics, and science. Form B was likewise divided into two halves of odd and even numbered items to provide two measures of subject-matter specific self-concept in each subject.

Tennessee Self-Concept Scale (TSCS)

The TSCS is made up of 100 items, 90 of which assess the self-concept and 10 of which are MMPI lie scale items. Half of the items are worded positively, and half are worded negatively to control for acquiescence response set. The scale is appropriate for persons age 12 and over or children with at least a 6th grade reading level. The response format is a 5-step scale ranging from "completely true" to "completely false." The instrument yields a total score and a variety of separate subscale scores.

Reliability

Fitts (1965) reported a total test-retest reliability coefficient of .92 for a sample of 60 college students after a 2-week interval. For other samples, test-retest reliabilities were reported to be in the high .80s (Bentler, 1972). There is no information available on the internal consistency of the scale or the scale subscores.

Validity

In the area of construct validity there is some evidence of convergent validity with other personality measures. The TSCS correlates .68 with Izard's Self Rating Positive Affect Scale (Wylie, 1974), -.70 with the Taylor Anxiety Scale, and in the .50s and .60s with various MMPI subscales (Bentler, 1972). The correlation between the TSCS and the Piers and Harris Scale was .80 for a junior high

sample and .73 for the same sample 6 months later (Shavelson & Bolus, 1982).

Wylie (1974) discussed the discriminant validity of the TSCS (1974) in terms of both the total scale and the subscales. She reviewed 14 studies that tested whether the TSCS discriminated between groups theoretically believed to differ on self-concept. The studies varied in the populations sampled (e.g., psychiatric patients, alcoholics, delinquents). Many of these studies found the expected group differences on the TSCS. Wylie pointed out that there were no reliability estimates available for such groups and that the somewhat confusing procedures for completion of the TSCS could lead to a high incidence of random responding among less able groups. Thus, support for construct validity derived from these studies is questionable.

Reviewers (Bentler, 1972; Suinn, 1972; Wylie, 1974) have uniformly agreed that the validity of the TSCS subscales has not been adequately demonstrated. Vacchiano and Strauss (1968) factor analyzed the TSCS and reported that only 75 of the 90 self-concept items contributed to the formation of factors. The analysis identified 20 factors that did not correspond to the row and column subscales in Fitts's scoring procedure. A second factor analysis by Rentz and White (1967) identified three factors with primary loadings on only one. Wylie questioned the appropriateness of factor analysis with the TSCS stating that "factor analyzing five row scores, three column scores, and one

total score . . . would lead to artifactual results in that numerous redundancies among scores are involved" (p. 232).

On the basis of the reliability estimates and validation data available, use of the TSCS as a measure of general or global self-concept is justified. However, there is a lack of empirical support for the interpretation of separate subscale scores.

The Piers Harris Way I Feel About Myself Scale (WIFM)

The WIFM is composed of 80 self-descriptive items, half of which are worded positively and half negatively to control for acquiescence response set. The scale is appropriate for grades 3 and over. The scale items were chosen on the basis of ability to discriminate high scorers from low scorers. The subject responds "Yes" or "No" to each item. The WIFM yields a total score and six "cluster" scores based on clusters identified by a factor analysis.

Reliability

For the original 95 item scale (15 items were dropped following an item analysis), Piers and Harris (1964) reported test-retest reliability coefficients of .72, .71, and .72 for 3rd, 6th, and 10th graders respectively, after a 4-month period. Internal consistency estimates for the same samples ranged from .78 to .93, using Kuder-Richardson formula 21.

Validity

There is limited but positive evidence of convergence with other self-concept measures. On a sample of retarded children, ages 12 to 16, the WIFM correlated .68 with Lipsitt's (1958) Self-Concept Scale for Children. As mentioned above, correlations of .80 and .73 were reported between the WIFM and the TSCS (Shavelson & Bolus, 1982). No information on the convergent validity of cluster scores is available.

Regarding discriminant validity, generally low correlations are reported between WIFM and IQ, as measured by several tests (Piers, 1969). On samples ranging from grades 3 to 10, correlations ranged from $-.04$ to $.48$. Only 3 of 11 correlations were significant, suggesting that self-concept, as measured by the WIFM, can be differentiated from intelligence. In 6 samples, ranging in grade level from 3 to 6, correlations between the WIFM and achievement scores ranged from $.06$ to $.43$. Five of these were significant but did not approach the convergent validity coefficients reported above. Discriminant validity is questionable in regard to anxiety. Millen (unpublished data cited in Piers, 1969; and Wylie, 1974) reported correlations between the Children's Manifest Anxiety Scale (Castenada, McCandles, & Palermo, 1956) and the WIFM ranging from $-.54$ to $-.69$. These correlations approach or exceed the convergent validity coefficients reported by Piers (1969). The authors maintained

that these high correlations represent a true trait relationship rather than an artifact of the instrumentation.

The WIFM manual suggests combinations of items that may be scored together to yield "cluster" scores. It is pointed out that these clusters are tentative and should be used primarily for research purposes. Six clusters were derived from a principal components factor analysis conducted by Piers and Harris (1964). Shavelson et al. (1976) cautioned against separate interpretations of cluster scores for several reasons. They pointed out that there is no conceptual framework provided that suggests that these are the factors to be expected. In addition, 13 of the items did not load on any of the factors, 11 loaded on more than one factor, and no correlations were reported between clusters or with other measures. Bentler (1972) made the observation that it is characteristic of a principal components analysis of binary items (yes/no response format) to result in too many factors. Examination of the factors shows that four of the six have a large imbalance of positively and negatively worded items, suggesting that response style is interacting with the content to distort factors. For this reason, Bentler found the scale to be more unidimensional than multidimensional and suggested that monotonicity analysis might be more appropriate than factor analysis.

This evidence suggests that total WIFM scores provide a stable and internally consistent measure of general self-concept that is differentiable from IQ and achievement but

that separate interpretation of cluster scores is not warranted.

The Michigan State Self-Concept of Ability Scale (SCA)

The SCA has two forms. Form A is an 8-item measure of self-concept of overall academic ability. Form B is made up of the same 8 items modified to request information on self-concept of ability in specific subject areas. The 8 items on each form compose a Guttman scale. Form A has a reproducibility coefficient of .91. The scale for mathematics on Form B has a reproducibility coefficient of .90. Reproducibility coefficients for the other subject-matter scales (English, science, and social studies) were not reported (Shavelson et al., 1976). All items have a five-choice response format and have been used primarily with junior and senior high school students. Data bearing on the scales reliability and construct interpretations were reviewed by Shavelson et al. and are summarized below.

Reliability

For samples of students in grades 7 to 10, test-retest reliability coefficients on Form A of the SCA ranged from .69 to .72 for boys and from .69 to .77 for girls after a 1 year period. For Form B test-retest reliabilities ranged from .70 to .80 for boys and from .63 to .77 for girls.

For Form A, internal consistency reliability ranged from .82 to .92 for boys and .77 to .84 for girls. Internal

consistency of Form B was reported to be above .89 for boys and girls in a 10th grade sample.

Validity

A factor analysis of Form A conducted by Paterson (1967) identified two factors. The first and primary factor was interpreted as self-concept of ability. The second factor was barely distinguishable from error and was interpreted as a time orientation factor. Seven of the eight items are oriented toward either present or future. This suggests that Form A of the SCA is a unidimensional measure (Shavelson et al., 1976).

Brookover, LePere, Hamachek, Thomas, and Erickson (1965) reported correlations between the two forms ranging from .62 to .73 for boys and from .54 to .71 for girls. Corrected for attenuation, these correlations ranged from the mid 70s to the mid 90s. Correlations between the specific subject-matter scales of Form B ranged from .63 to .88 for boys and from .52 to .68 for girls. Corrected for attenuation these correlations ranged from the mid .60s to the mid .80s.

Despite the high intercorrelations among the subscales, Shavelson et al. (1976) argued that separate subscale interpretations are probably warranted but should be made cautiously. The reasoning for this is that the mean scores for the two forms fall into a predictable pattern. The mean scores on Form A are higher than any of the mean scores on

Form B. The mean score on Form A is closest to the mean score on the subject-matter specific scale in which the students had their highest grades. On Form B, correlations between subject-specific scores and grades in the same subject are higher than correlations between subject-specific scores and grades in different subjects (except in one instance). Because of the consistent and predictable pattern of correlations and mean scores, Shavelson et al. suggested that cautious interpretation of scores on separate forms is warranted.

Summary

This section reviewed reported reliability estimates and data bearing on the validity of three self-concept measures. All of the measures reviewed possess sufficient reliability and validity to be used for research purposes.

Both the Tennessee Self-Concept Scale and the Way I Feel About Myself Scale are sufficiently reliable and valid as measures of general or global self-concept and were used for this purpose in the present study. Both of these scales provide subscale scores; however, empirical evidence in support of valid subscale score interpretation is lacking. Thus, the subscale scores for these measures were disregarded in the present study.

The Michigan State Self-Concept of Ability Scale has two forms: general and subject-matter specific. Factor analysis of Form A (general) suggests that it is a

unidimensional measure of self-concept of general academic ability and is used as such in the present study. Correlational analysis of Forms A and B suggest that they are separately interpretable due to predictable and consistent patterns in mean scores and correlations; however, the magnitude of the correlations suggest that interpretations be made very cautiously. In the present study parallel halves of Form A were used as two measures of self-concept of overall academic ability, and parallel halves of Form B were used as two measures of subject-matter specific self-concept in English, mathematics, and science.

Analysis of the Data

The definitional features of self-concept were examined with both zero correlations and analysis of covariance structures using the LISREL IV computer program (Joreskog & Sorbom, 1978). The basis of the data analysis is summarized in Figure 1. Each measure used in the study is represented by a box. The circles represent the underlying constructs the measures were designed to assess. The straight arrows from circles to boxes indicate that the construct causes performance on the measure. Curved arrows indicate correlational, not causal, relationships. Error terms are represented by lower case es. Straight arrows between constructs represent hypothesized causal relationships. Data analysis proceeded sequentially and is detailed below.

WIFM = Way I Feel About Myself Scale
TSCS = Tennessee Self-Concept Scale
SCA = Michigan State Self-Concept of Ability Scale, Form A,
Halves I and II.
SCE = Michigan State Self-Concept of Ability Scale, Form B,
for English, Halves I and II.
SCM = Michigan State Self-Concept of Ability Scale, Form B,
for Mathematics, Halves I and II.
SCS = Michigan State Self-Concept of Ability Scale, Form B,
for Science, Halves I and II.
GSC = General Self-Concept
ASC = Overall Academic Self-Concept
SCE = Self-Concept in English
SCM = Self-Concept in Mathematics
SCS = Self-Concept in Science
e = error terms for respective measures.

Figure 1.

Hypotheses

Hypothesis 1: The Multifaceted Feature of Self-Concept

Figure 1 represents the five factor model of the academic area of self-concept hypothesized in the present study. This model was compared to a one factor model positing a single self-concept measured by all of the measures; and a two-factor model positing general self-concept measured by the WIFM and the TSCS, and academic self-concept measured by the remaining 8 measures. These three models were compared in a chi-square goodness of fit test. With regard to Figure 1, it should be noted that in the comparison of the models all of the Time 2 factors were permitted to be related to all of the Time 1 factors (i.e., the structural model in Figure 1 was not imposed on the data). Had this model been imposed the comparison of the five factor model to the other two models would have confounded the number of factors with the structural aspects of the model.

Hypothesis 2: The Hierarchical Feature of Self-Concept

Figure 1 also represents a hierarchical model such that general self-concept is at the apex of the hierarchy followed in descending order by academic self-concept and the three subject-matter specific self-concepts. The hierarchical model assumes that the five factor model provides the best fit to the data and was tested by examining the

relationships between the five hypothesized constructs. A hierarchical structure should produce a pattern of correlations such that general self-concept is more highly correlated with academic self-concept than with subject-matter specific self-concepts at both points in time and over a 6-month time period. The hierarchical structure was also tested by examining the regression coefficients between factors at Time 1 and Time 2. The hierarchical model in Figure 1 suggests that all factors at Time 1 are predictive of general self-concept at Time 2 and that academic self-concept and all subject-matter specific self-concepts at Time 1 are predictive of academic self-concept at Time 2.

Hypothesis 3: Stability of the Structure of Self-Concept

A test of the stability of the structure of self-concept was conducted by examining the equality over time of the factor loadings, variances of and covariances among the hypothesized constructs, and the unique variances of the factors.

Hypothesis 4: The Stability Feature of Self-Concept

The hypothesized model proposed that the higher levels of the hierarchical structure were more stable than the lower levels. This hypothesis was tested by examining the correlations (stability coefficients) between each factor at Time 1 and Time 2. The stability coefficients should produce a pattern such that general self-concept is the

highest, academic self-concept is the next highest, and subject-matter specific self-concepts are the lowest.

Hypothesis 5: The Multifaceted Feature of Self-Concept is Invariant Across Grade Levels.

A model positing that the five-factor model of self-concept is invariant across grade levels was tested with analysis of covariance structures.

Hypothesis 6: The Hierarchical Feature of Self-Concept is Invariant Across Grade Levels.

The correlations among facets at each point in time, and over a 6-month period were examined separately for each of the three age groupings. The t -values for the estimated regression coefficients predicting Time 2 factors from Time 1 factors were also examined separately for each of the three age groupings.

Hypothesis 7: The Stability Feature of Self-Concept is not Invariant Across Grade Levels.

The correlations between each factor at Time 1 and Time 2 (stability coefficients) were examined separately for each age grouping and are presented under hypotheses 8, 9, and 10.

Hypothesis 8: For the 7th and 8th Grade Sample all Facets of Self-Concept are Highly and Equally Stable.

Hypothesis 9: For the 9th and 10th Grade Sample the Stability of the Facets Increases Toward the Apex of the Hierarchy.

Hypothesis 10: For the 11th and 12th Grade Sample the Stability of the Facets Increases Toward the Apex of the Hierarchy.

CHAPTER IV

RESULTS

Descriptive Data

The mean scores and standard deviations for all measures at Time 1 and Time 2 are summarized for the three age groupings in Table 1.

The group from which norms were developed for the TSCS was an extremely diverse sample of persons ranging in age from 12 to 68 (N=626). In the test manual for the TSCS, Fitts (1965) claimed that persons do not differ appreciably on the basis of age, sex, race, and other variables, provided the sample size is large enough (75 or more), and that separate normings are not necessary. The reported mean for the norm group was 345.57, with a standard deviation of 30.7. In the present study mean scores on the TSCS ranged from 322.22 to 337.68, with standard deviations ranging from 33.15 to 39.17.

Piers and Harris (1969) provided normative data on the WIFM for different age grouped samples from several regions of the country. The mean score for a sample of 1183 public school students in a small town in Pennsylvania was 51.84, with a standard deviation of 13.87. This was the overall mean score and standard deviation for samples of 4th, 6th

8th, 10th, and 12th graders. In the present study, mean scores on the WIFM at the time of the first data collection ranged from 55.58 to 58.85, with standard deviations ranging from 11.43 to 13.45. On the basis of scores from various normative samples, Piers and Harris stated that average scores could be expected to fall between 46 and 60. The mean scores of the samples in the present study appear then to be at the high end of what is considered the average range. At the time of the second data collection there was a very slight increase in mean scores for all groups on the WIFM, (this was also true for the TSCS). Piers and Harris found this to occur with most samples that were retested and suggested that this might be due to greater familiarity with the test items.

In the present study, Form A and three subject-matter specific variations of Form B of the Michigan State Self-Concept of Ability Scale were divided into odd and even split halves and comprise the remaining 16 scales. Normative descriptive data are not available for these scales. The mean scores and standard deviations from the test scores of the students sampled in the present study are provided in Table 1.

The data in Tables 2, 3, and 4 are the factor loadings resulting from the factor analysis in which the hypothesized 5 factor model was tested using LISREL IV. These factor loadings are expressed on a scale which is set by having the pooled within group factor score variances equal to one for

Table 1

Means and Standard Deviations For Observed Measures atTime 1 and Time 2

	Group 1 (N=144)		Group 2 (N=162)		Group 3 (N=122)	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
TSCS	323.58	38.14	322.22	34.68	332.77	33.15
TSCS _{T1}	329.14	39.17	323.82	35.34	337.68	34.35
WIFM	55.58	13.45	56.16	13.18	58.85	11.43
WIFM _{T1}	57.06	13.92	57.83	12.55	60.54	11.31
ASCA	13.74	2.63	12.96	1.82	14.11	1.91
ASCA _{T1}	13.97	2.67	13.10	1.79	14.07	2.10
ASCB	15.11	3.19	14.24	2.69	15.97	2.28
ASCB _{T1}	15.23	3.14	14.23	2.75	15.67	2.72
MSCA	13.74	3.46	14.18	2.46	14.42	2.73
MSCA _{T1}	14.40	3.39	13.68	2.65	14.24	3.09
MSCB	14.33	3.67	14.80	2.75	15.59	3.03
MSCB _{T1}	14.73	3.76	14.36	3.27	15.26	3.20
ESCA	14.16	2.93	12.53	2.37	13.12	2.52
ESCA _{T1}	14.33	2.68	12.72	2.78	13.27	2.94
ESCB	14.90	3.01	13.08	2.80	13.77	2.95
ESCB _{T1}	15.02	2.92	13.19	3.23	14.09	3.33
SSCA	14.38	3.15	13.06	2.49	14.44	2.88
SSCA _{T1}	14.54	3.12	13.66	2.89	14.17	2.89
SSCB	15.07	3.26	13.38	2.95	15.30	3.09
SSCB _{T1}	14.88	3.28	14.42	2.99	15.29	3.14
SSCB _{T2}						

Note. Maximum score for each scale is as follows: TSCS, 450; WIFM, 80; all of the remaining scales, 20. The scales are abbreviated in the following way: TSCS--Tennessee Self-Concept Scale; WIFM--Way I Feel About Myself Scale; (the remaining 16 scales are sub-forms of the Michigan State Self-Concept of Ability Scale and are abbreviated); ASCA--Academic Self-Concept, half A; ASCB--Academic Self-Concept, half B; MSCA--Mathematics Self-Concept, half A; MSCB--Mathematics Self-Concept, half B; ESCA--English Self-Concept, half A; ESCB--English Self-Concept, half B; SSCA--Science Self-Concept, half A; SSCB--Science Self-Concept, half B. Subscripts T1 and T2 indicate time of data collection.

Table 2

Factor Loadings Scaled by the Pooled Observed Variable
Standard Deviations For the Five Factor Model

<u>Group 1</u>										
General Factor		Academic Factor		Math Factor		English Factor		Science Factor		
T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	
TSCS	.87 .85									
WIFM	.94 .92									
ASCA		.85 .86								
ASCB		.83 .78								
MSCA				.95 .94						
MSCB				.91 .96						
ESCA						.88 .88				
ESCB						.85 .95				
SSCA								.92 .90		
SSCB								.90 .99		

all five factors at each occasion and by having pooled within group observed score variances equal to one for all ten variables at each occasion. This scaling was chosen so that the factor loadings would be expressed on a scale similar to that obtained by factor analyzing correlation matrices. The loadings greater than one in Tables 3 and 4 arise because the scale used in this study is not precisely the same scale that arises from factor analyzing correlations.

In order to fit the model simultaneously to the three groups, the starting values for the factor loadings for the first of each pair of observed measures (i.e., TSCS, ASCA, MSCA, ESCA, and SSCA) were set to equal one for each group. This resulted in identical factor loadings on those variables for all three groups. The factor loadings for the second number of each pair of observed measures (i.e., WIFM, ASCB, MSCB, ESCB, and SSCB) were not artificially precluded from varying across groups. Inspection of Tables 2 to 4 shows, however, that the magnitude of the loadings for each of these variables does not vary extensively over groups. Thus, the factor loadings appear to be invariant across groups. In a similar fashion the factor loadings for each variable do not vary much from the first to second data collection. Thus, the factor loadings seem to be invariant over time. The results of formal hypothesis tests of these invariances are presented in a subsequent section.

In Table 5, the unique variances for each measure at each data collection are presented for all age groupings. These values were obtained by taking the unique variances estimated by the LISREL program and scaling them by the pooled variance over groups. A visual inspection of the data in Table 5 indicates that for each age grouping the unique variances are similar in magnitude over time.

Interfactor correlations are presented in Tables 6, 7, and 8 for groups 1, 2, and 3 respectively. Each table presents the interfactor correlations for the group at Time 1, Time 2, and between Times 1 and 2. Data from these tables are abstracted as they bear on specific hypotheses in the latter portion of this chapter.

The results of this study are presented sequentially as they pertain to hypotheses 1 through 10. In some instances hypotheses were tested simultaneously and in others hypotheses were precluded by the findings of earlier hypotheses. In these cases the reader is referred to the appropriate data, and the result is briefly summarized.

Test of Hypotheses

Hypothesis 1: The Multifaceted Feature of Self-Concept

Hypothesis 1 stated that self-concept, as measured in the present study, is composed of five facets. The hypothesized facets are those expressed in circles in Figure 1, and include a) general self-concept (GSC), b) academic

Table 5

Unique Variances of Observed Measures

	Group 1		Group 2		Group 3	
	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
TSCS	.30	.31	.25	.30	.17	.21
WIFM	.10	.21	.14	.08	.20	.25
ASCA	.34	.33	.28	.19	.18	.25
ASCB	.24	.26	.19	.17	.17	.23
MSCA	.14	.18	.08	.06	.09	.10
MSCB	.15	.09	.15	.23	.17	.13
ESCA	.22	.22	.19	.22	.26	.23
ESCB	.10	.05	.11	.09	.10	.08
SSCA	.20	.24	.14	.19	.11	.12
SSCB	.12	.04	.18	.07	.17	.18

Table 6

Interfactor Correlations, Group 1

Group 1, Time 1					
	General	Academic	Mathematics	English	Science
General	1				
Academic	.578	1			
Mathematics	.465	.817	1		
English	.548	.785	.589	1	
Science	.463	.737	.51	.75	1

Group 1, Time 2					
	General	Academic	Mathematics	English	Science
General	1				
Academic	.636	1			
Mathematics	.486	.858	1		
English	.534	.729	.506	1	
Science	.475	.708	.528	.707	1

Group 1, Time 1 with Time 2					
	<u>Time 2</u> General	Academic	Mathematics	English	Science
<u>Time 1</u> General	<u>.86</u>				
Academic	.535	<u>.935</u>			
Mathematics	.481	.749	<u>.832</u>		
English	.438	.677	.483	<u>.762</u>	
Science	.412	.605	.401	.64	<u>.77</u>

Note. The underlined values are stability coefficients for the five factors.

Table 7

Interfactor Correlations, Group 2

Group 2, Time 1					
	General	Academic	Mathematics	English	Science
General	1				
Academic	.596	1			
Mathematics	.394	.662	1		
English	.405	.729	.273	1	
Science	.425	.608	.237	.403	1

Group 2, Time 2					
	General	Academic	Mathematics	English	Science
General	1				
Academic	.711	1			
Mathematics	.443	.592	1		
English	.53	.782	.287	1	
Science	.33	.639	.289	.346	1

Group 2, Time 1 with Time 2					
	<u>Time 2</u> General	Academic	Mathematics	English	Science
<u>Time 1</u> General	<u>.894</u>				
Academic	.539	<u>.891</u>			
Mathematics	.352	.501	<u>.623</u>		
English	.338	.561	.342	<u>.70</u>	
Science	.261	.477	.321	.292	<u>.604</u>

Note. The underlined values are stability coefficients for the five factors.

Table 8

Interfactor Correlations, Group 3

Group 3, Time 1					
	General	Academic	Mathematics	English	Science
General	1				
Academic	.418	1			
Mathematics	.082	.71	1		
English	.44	.689	.17	1	
Science	.41	.691	.33	.33	1

Group 3, Time 2					
	General	Academic	Mathematics	English	Science
General	1				
Academic	.406	1			
Mathematics	.148	.716	1		
English	.248	.514	.004	1	
Science	.33	.617	.324	.217	1

Group 3, Time 1 with Time 2					
	<u>Time 2</u> General	Academic	Mathematics	English	Science
<u>Time 1</u> General	<u>.917</u>				
Academic	.175	<u>.91</u>			
Mathematics	-.06	.59	<u>.921</u>		
English	.25	.461	.04	<u>.797</u>	
Science	.24	.649	.39	.274	<u>.836</u>

Note. The underlined values are stability coefficients for the five factors.

self-concept (ASC), c) self-concept in English (SCE), d) self-concept in mathematics (SCM), and e) self-concept in science (SCS). This hypothesized model posits a completely differentiated structure and is compared to two competing models in Table 1. Model 1, a single-factor model, posited a unitary general self-concept measured by all of the observed measures. Model 2, the two-factor model, posited a general self-concept measured by the WIFM and the TSCS, and an academic self-concept measured by all of the remaining measures. Model 3 is the hypothesized five-factor model. These three models were tested with an analysis of covariance structures. For each model tested, the same model was fit simultaneously to the data for all three groups.

Measures of the goodness of fit for each of the models to the data are shown in Table 9. The adequacy of fit is expressed as a ratio of chi-square to degrees of freedom. An adequately fitting model will result in a ratio lying somewhere between 1 and 10 with the lowest ratio expressing the best fit. An alternative indice for the degree of fit is Δ , proposed by Bentler and Bonnett (1980). This measure is calculated by obtaining the difference between the chi-square of the proposed model and the chi-square of the null model and dividing that difference by the chi-square of the null model, which postulates that all variables are uncorrelated. The resulting value is normed to lie on a scale of 0 to 1, with a higher value expressing a better fit. The data in Table 9 indicate that model 3, the

hypothesized five-factor model, provided the best fit to the data. The chi-square ratio test for model 1 resulted in a value exceeding 10, suggesting a very poor fit to the data. The test of model 2 resulted in a decrement in the chi-square (χ^2 (14) = 951.2347, $p < .01$) indicating that model 2 fits the data significantly better than model 1; however, the ratio of chi-square to degrees of freedom of 8.48 suggests a poor fit to the data. The test of model 3 resulted in a significant decrement in the chi-square (χ^2 (117) = 2813.5276, $p < .01$) indicating a significant improvement in the fit of the model to the data when the model is relaxed by

Table 9

Tests of the Multifaceted Structure of Self-Concept
Competing Models

	χ^2	df	χ^2/df	Δ
0. Null model (Complete independence/ total covariation)	9418.1654	570	16.52	
1. General self-concept (single factor model)	5123.7220	507	10.10	.4559
2. General and academic self-concept (two factor model)	4172.4873	492	8.48	.5569
3. General, academic and subject-matter specific self-concepts five factor model)	1358.9597	375	3.62	.8557

introducing the five factors. Moreover, this finding offers support for a multifaceted interpretation of self-concept. An examination of the Δ values for each of the three models led to the same conclusion.

Hypothesis 2: The Hierarchical Structure of Self-Concept

The hierarchical feature of self-concept is implicit in several of the other definitional features of the construct. In order to establish support for a hierarchical structure it must first be assumed that the area of self-concept under consideration consists of multiple facets. For this reason Shavelson and Bolus (1982) treated the tests of the one factor, two factor, and five factor models as a simultaneous test of the multifaceted feature and the hierarchical feature and stated that "in order to test the assumption of a hierarchical, multifaceted structure of self-concept, at least one area of self-concept must be measured, and the measurements must be made at two or more levels of the hierarchy" (p. 7). Inasmuch as this study replicated the Shavelson and Bolus study, this condition was fulfilled, and the empirical evidence supporting the five-factor model provided partial support for the hierarchical structure.

Subsequent to supporting the multifaceted feature of the construct, additional evidence bearing on the hierarchical structure can be found by examining the pattern of correlations among the facets. Specifically, Shavelson and Bolus (1982) stated that "a hierarchical structure should

produce a pattern of correlations such that GSC correlates most with ASC, next with subject-matter self-concepts" (p. 15). These data are presented in Tables 10a and 10b. Correlations among facets are tabled separately for each age grouping at Time 1 and each age grouping at Time 2.

A pattern of correlations conforming to the hierarchical structure described by Shavelson and Bolus is apparent for all age groupings at Time 1, and all age groupings at Time 2, with the single exception of the 11th and 12th grade group at Time 1. It should be noted that in some cases (e.g., seventh and eighth grade subjects at Time 1) the correlation between GSC and ASC is of only slightly greater magnitude than the correlations between GSC and subject-matter specific self-concepts. These findings are generally supportive of a hierarchical structure, though the restricted range of correlations warrants cautious interpretation.

The relationships among facets over time are also relevant to the hierarchical feature of self-concept. A hierarchical model would predict that GSC at Time 2 is more highly related to ASC at Time 1 than to any of the subject-matter specific self-concepts at Time 1. These correlations are presented in Table 11.

In accordance with expectations the patterns of relationships for 7th, 8th, 9th, and 10th graders show that GSC at Time 2 is more highly related to ASC at Time 1 than to any of the subject-matter specific self-concepts at

Table 10a

Correlations Among Facets at Time 1

	ASC	SCE	SCM	SCS
GSC _{7,8}	.57	.54	.46	.46
GSC _{9,10}	.59	.40	.39	.423
GSC _{11,12}	.41	.44	.08	.41

Note. Subscripts indicate grade levels.

Table 10b

Correlations Among Facets at Time 2

	ASC	SCE	SCM	SCS
GSC _{7,8}	.63	.53	.49	.47
GSC _{9,10}	.71	.534	.44	.33
GSC _{11,12}	.40	.24	.14	.33

Note. Subscripts indicate grade levels.

Table 11

Correlations Among Facets Over Time

	Time 1 ASC	SCE	SCM	SCS
Time 2				
GSC _{7,8}	.53	.43	.48	.41
GSC _{9,10}	.53	.33	.35	.26
GSC _{11,12}	.17	.25	-.06	.24

Note. Subscripts indicate grade levels.

Time 1. No such pattern is apparent for the eleventh and twelfth grade sample. The correlations for this age grouping suggest that there is very little relationship between academically-related self-concepts at one point in time and general self-concept 6 months later.

In the multifaceted, hierarchical model of self-concept represented in Figure 1, the straight arrows between constructs at Time 1 and Time 2 depict hypothesized causal relationships. The strength of these causal relationships are measured by regression coefficients. Figure 1 suggests that GSC, ASC, SCE, SCM, and SCS at Time 1 are all predictive of GSC at Time 2, and that ASC, SCE, SCM, and SCS at Time 1 are all predictive of ASC at Time 2. In Tables 12a, 12b, and 12c, t-values for the estimated regression coefficients predicting Time 2 factors from Time 1 factors are presented for each age grouping.

These data reveal that for all age groupings the only significant predictor of each factor at Time 2 is its own counterpart at Time 1. With regard to causal relationships and predictive utility these data do not support a hierarchical conceptualization of self-concept.

Hypothesis 3: Stability of the Structure of Self-Concept

Hypothesis 3 stated that the multifaceted structure of self-concept was stable over a 6 month period. In order to test this hypothesis for all grade levels a simultaneous test for stability over time and invariance of the

Table 12a

T-values for Estimated Regression Coefficients Predicting
Time 2 Factors From Time 1 Factors for 7th and 8th Grade
Subjects

	GSC	ASC	SCM	SCE	SCS
GSC	10.136	-1.613	2.046	-.113	1.079
ASC	-2.232	4.033	-1.138	-.346	-.083
SCM	-1.224	1.404	4.220	.617	1.858
SCE	.524	.024	.858	4.572	2.274
SCS	-.318	1.610	-.883	-.566	5.972

Table 12b

T-values for Estimated Regression Coefficients Predicting
Time 2 Factors From Time 1 Factors for 9th and 10th Grade
Subjects

	GSC	ASC	SCM	SCE	SCS
GSC	8.961	-1.011	.881	.260	.981
ASC	-.958	2.475	-.470	-.972	-1.023
SCM	1.067	-.020	4.144	.608	.676
SCE	.214	.633	-1.301	2.90	-.189
SCS	.740	.348	-.126	-.547	3.508

Table 12c

T-values for Estimated Regression Coefficients Predicting
Time 2 Factors From Time 1 Factors for 11th and 12th Grade
Subjects

	GSC	ASC	SCM	SCE	SCS
GSC	11.514	-1.442	.251	1.729	1.090
ASC	.303	2.867	-.871	-.595	-.357
SCM	1.082	.259	5.547	-.104	.184
SCE	2.207	-1.339	1.699	5.613	.966
SCS	1.389	-3.372	.189	.240	7.539

multifaceted structure across grade levels (hypothesis 5) was conducted. Model 4 posited that the factor loadings were equivalent at Time 1 and Time 2 and were invariant across all grade levels. Model 4 is compared with Model 3 in Table 13.

To test these equality constraints over groups and occasions, model 4 and model 3 can be compared to see whether the less restrictive model (model 3) fits the data substantially better than the more restrictive model (model 4). If model 3 fits the data better, it suggests that the equality constraints are incorrect. On the other hand, if model 3 does not fit the data better than model 4, then it supports the conclusion that the equality constraints are correct.

Table 13

Five Factor Model Compared With Tests of Equivalence Over Time and Invariance Across Grades

Models	χ^2	df	χ^2/df	Δ
3. General, academic, and subject-matter specific self-concepts (five-factor model)	1358.9597	375	3.62	.8557
4. General, academic and subject-matter specific self-concepts (five-factor model), equivalence over time and invariance across age groups)	1403.5467	400	3.508	.8509

The chi-square difference between model 3 and model 4 is nonsignificant ($\chi^2 (25) = 44.5820$, $p > .05$), indicating that relaxing the equality constraints over groups and occasions does not result in a significantly better fit to the data--thus the conclusion that model 4 is adequate for the data is supported.

In addition, the chi-square to degrees of freedom ratio test and the Δ value for Model 4 indicate that this model provided an adequate fit to the data. On the basis of this finding it was concluded that the multifaceted structure of self-concept is invariant across all grade levels and that for all grade levels this structure remains stable over at least a 6-month period.

Hypothesis 4: The Stability Feature of Self-Concept

On the basis of the definitional features of self-concept described by Shavelson, Hubner, and Stanton (1976), it was hypothesized that the various facets of self-concept would vary in stability by hierarchical level. Specifically, GSC was hypothesized to be the most stable facet, ASC the next most stable, and subject-matter specific self-concepts the least stable.

Correlations between facets at Time 1 and Time 2 are presented in Table 14 as estimates of stability for each facet. A clear pattern of increasing stability was not readily discernible for any of the age groupings tested; however for the middle age group the stability coefficients for GSC and ASC are substantially higher than the stability coefficients for the subject-matter specific self-concepts.

Table 14

Correlations Between Facets at Time 1 and Time 2

Self-concept facet	Stability Coefficients		
	Grades 7 & 8	Grades 9 & 10	Grades 11 & 12
GSC	.86	.89	.92
ASC	.94	.89	.91
SCE	.76	.70	.80
SCM	.83	.62	.92
SCS	.77	.60	.84

These findings are discussed in more detail under hypotheses 7, 8, 9, and 10.

Hypotheses 5, 6, 7, 8, 9, and 10: The Developmental Feature of Self Concept

Under hypotheses 1 through 4, definitional features of the self-concept construct were tested for a sample of seventh through twelfth graders ($N=428$). Hypotheses 5 through 10 reexamine these definitional features separately for 7th and 8th grade students ($N=144$), 9th and 10th grade students ($N=162$), and 11th and 12th grade students ($N=122$).

Hypothesis 5: Invariance of the Multifaceted Feature of Self-Concept

It was hypothesized that the five-factor model of self-concept was invariant across all grade levels. This hypothesis was tested simultaneously with hypothesis 3. In Table 13, a model positing invariance across grade levels was compared to the five-factor model. The invariance model was found to provide an adequate fit to the data

($\chi^2/df=3.508$; $\Delta = .8509$), thus supporting hypothesis 5.

Hypothesis 6: Invariance of the Hierarchical Feature of Self-Concept

The hierarchical structure of self-concept (hypothesis 2) received modest support. Several sources of data are presented bearing on this feature of the construct. These data also address the issue of invariance.

The hierarchical feature of the construct was supported partially by the finding that self-concept is multifaceted (see Table 9) and that the multifaceted structure was invariant across age groupings (see Table 13). These findings offer indirect support for the invariance of the hierarchical nature of self-concept.

Correlations among facets at each point in time (Tables 10a and 10b) and correlations among facets over a 6-month period (Table 11) also offered modest support for the hierarchical feature of self-concept. The correlations generally approximated the hierarchical pattern described by Shavelson and Bolus (1982) for grades 7, 8, 9, and 10 but not for 11th and 12th graders. For this older age grouping correlations between lower level self-concepts and general self-concept were the lowest of all age groupings tested and fell into no discernible pattern.

The last data presented bearing on the hierarchical nature of the construct are the t -values for the estimated regression coefficients predicting Time 2 factors from Time 1 factors (Tables 12a, 12b, and 12c). These data do not support a hierarchical conceptualization of self-concept for any of the age groupings tested.

In summary, there is limited support for the hierarchical feature of self-concept. With respect to invariance, it can be concluded that the multifaceted feature of self-concept is invariant across grade levels from 7th to 12th grade but that the pattern of associations among the

facets that are suggestive of a hierarchical structure appear to "wash out" by the 11th or 12th grade.

Hypothesis 7: The Stability Feature of Self-Concept is Not Invariant Across Grade Levels.

On the basis of earlier findings (Shavelson & Bolus, 1982), it was hypothesized that a pattern of increasing stability, from specific to general levels of self-concept, would be discernible for the two older age groupings but not for the youngest. The stability coefficients between each facet at Time 1 and Time 2 are presented in Table 14 and are discussed separately for each age grouping under hypotheses 8, 9, and 10.

Hypothesis 8: For the 7th and 8th Grade Sample All Facets of Self-Concept are Highly and Equally Stable.

For the 7th and 8th grade sample, stability coefficients ranged from .76 to .94, and no clear pattern of increasing stability was apparent, thus supporting hypothesis 8. This finding replicated earlier findings reported by Shavelson and Bolus (1982).

Hypothesis 9: For the 9th and 10th Grade Sample the Stability of the Facets Increases Toward the Apex of the Hierarchy.

The stability coefficients for the 9th and 10th grade students offer general support for hypothesis 9. As expected, subject-matter specific self-concepts (rs range from .60 to .70, see Table 14), though relatively stable

over a 6-month period, are less stable than the higher level facets ($r_s = .89$ for both GSC and ASC). A clear pattern of increasing stability, from specific to general facets, is obscured by the equivalence of the coefficients for GSC and ASC; however, there does appear to be a clear demarcation in stability between the higher and lower level facets for this age group.

Hypothesis 10: For the 11th and 12th Grade Sample the Stability of the Facets Increases Toward the Apex of the Hierarchy.

It was hypothesized that a pattern of increasing stability, from lower to higher level facets, would become more discernible with age. The stability coefficients for the 11th and 12th grade sample do not support this view. All facets of self-concept for this age grouping are highly stable (r_s range from .797 to .92, see Table 14) and no clear pattern of increasing stability was apparent.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to examine recent claims concerning the construct definition of self-concept. The study was conducted in response to the need to provide data relevant to the development of self-structures during the adolescent years and to further the study of the within-construct portion of the nomological network of associations in the self-concept literature. Four of seven definitional features of self-concept were directly tested with data obtained from a sample of 428 7th through 12th graders. The features tested were the multifaceted and hierarchical features, the feature of varying stability by hierarchical level, and the developmental feature of self-concept.

The results provided strong empirical support for a multifaceted interpretation of self-concept for all grade levels tested. This result is consistent with the recent literature on self-concept and is discussed in terms of its strength as a definitional feature of the construct.

The hypothesis that self-concept is structured hierarchically received only modest support in the present study. In the discussion that follows, several questions are raised

concerning the specific meanings, both stated and implied, that are associated with the term hierarchical. The findings of this aspect of the study are discussed both in terms of how they relate to previous research and the implications they hold for other within-construct associations.

It was hypothesized that self-concept varies in stability by hierarchical level and that this feature of the construct is most salient among the older age groupings. The findings revealed that, for all age groupings tested, all levels of self-concept were highly stable with only slight differences by grade levels. These findings are discussed in relation to the other definitional features and the implications they hold for future study.

The fourth definitional feature considered in the present study was the developmental aspect of self-concept. Within the theoretical framework proposed by Shavelson et al. (1976), upon which the present study was based, the only claim that has been made to date concerning the developmental feature of the construct was that it becomes increasingly multifaceted with age. In the present study the multifaceted feature was tested for invariance across three age groupings spanning the junior high school and senior high school years. The model positing invariance was found to provide a good fit to the data suggesting that the 5-factor model tested was both stable over a 6-month period

and applicable to all age groupings. In addition to examining the multifaceted issue in the development of self-concept, other hypothesized features of the construct were studied in a developmental context. Data bearing on the hierarchical structure of self-concept were compared for the three age groupings, as were stability coefficients. Different patterns of relationships among facets were noted and are discussed in terms of their implications for the development of self-concept.

The Construct Definition of Self-Concept

The Multifaceted Feature of Self-Concept

The multifaceted feature of self-concept has consistently been supported in recent empirical investigations. The variety of methodological approaches used to study this feature further suggest that it is a particularly robust definitional feature of the construct. Multiple facets of self-concept have been reported through the use of factor analytic techniques (e.g., Michael, Smith & Michael, 1975), analysis of multitrait-multimethod matrices (e.g., Marsh, Smith, Barnes, & Butler, 1983), and analysis of covariance structures (e.g., Shavelson & Bolus, 1982). The findings of the present study provided additional support for the validity of this feature of the construct. Earlier findings (Shavelson & Bolus, 1982) were replicated and were also shown to be applicable to a more developmentally diverse

sample of subjects. A 5-factor model of self-concept in the academic area was found to provide the best fit to the data compared to three more restricted models and was also found to be invariant across junior and senior high school samples.

On the basis of the extant research, it may be concluded that self-concept is composed of many related but distinguishable facets. Of the seven definitional features originally proposed by Shavelson et al. (1976), the multifaceted feature has received the most attention from researchers and is quickly becoming a well-documented, empirically defensible definitional parameter of the construct. For this reason it may be of greater practical value to educators than other features of the construct. The findings suggest that self-concept in academics is a highly organized set of self-perceptions. Students' self-evaluations of ability are not only of a general nature but are specific with regard to subject area. This area of study clearly merits further investigation.

These findings strongly suggest that the academic area of self-concept is composed of a number of related but distinguishable facets. Further efforts to study the relationships between self-concept and other variables of interest in education (between-construct studies) should take into consideration the multifaceted nature of the construct and avoid restrictive definitions that imply a single unitary trait.

The Hierarchical Feature of Self-Concept

The use of the term "hierarchical" is not clearly defined in the self-concept literature. Shavelson and Bolus (1982) reported support for a hierarchical definition of self-concept on the basis of specifically and generally defined factors and the relationships among these factors. Marsh, Smith, Barnes and Butler (1983) also reported empirical evidence of a hierarchically ordered factor structure.

In the present study the hierarchical feature was tested in several ways. The findings provided modest support for this interpretation of the construct. Various uses of the term hierarchical are discussed below as they relate to the empirical findings.

According to Shavelson et al. (1976), the hierarchical feature refers to the ordering of self-concept facets from general to specific. On the basis of this definition alone, a hierarchical structure could be inferred through the confirmation of a hypothesized factor structure positing several distinct factors at varying levels of specificity. The model that provided the best fit to the data in the present study consisted of factors described as general, academic, and subject-matter specific. Thus, at this level of analysis, the term hierarchical serves a descriptive purpose; however, a more stringent test of a facet's placement in a hierarchical ordering requires going beyond the label assigned to the facet. The label is merely descriptive and is often assigned arbitrarily.

The term hierarchical implies certain logical relationships among facets. If general self-concept is defined as the sum total of all self-perceptions, then the level of specificity of any given facet may be defined as its degree of relationship to general self-concept. In the present study a hierarchical structure would predict that general self-concept is more highly related to overall academic self-concept than to subject-matter specific self-concepts. This prediction was substantiated for the seventh and eighth grade sample and the ninth and tenth grade sample. For the oldest age grouping the relationships among facets did not clearly fit this pattern. At the time of the first data collection, overall academic self-concept and self-concepts of ability in English and science all showed approximately equal relationships to general self-concept with r s ranging from .41 to .44. At the time of the second data collection, 6 months later, relationships among facets more closely approximated the pattern predicted by the hierarchical structure. The relationship between overall academic self-concept and general self-concept had remained stable at .40, and the correlations between subject-matter specific self-concepts and general self-concept ranged from .14 to .33. The correlations among facets over time were also examined. For the eleventh and twelfth grade sample, the correlations between subject-matter specific self-concepts at Time 1 and general self-concept at Time 2 ranged from -.06 to .25. The

correlation between overall academic self-concept at Time 1 and general self-concept at Time 2 was .17.

These findings suggest that for the oldest age grouping sampled self-concept of overall academic ability comprises a set of self-perceptions that were neither more general nor more specific than their perceptions of abilities in specific subject areas. These findings raise several questions concerning whether it is appropriate to describe self-concept as a hierarchically ordered construct. For the students nearing the end of their high school years, academically related self-concepts did not fall into a predictable pattern in relation to general self-concept and, in fact, were not very highly related to general self-concept.

One explanation for this finding may be that the hierarchical arrangement of self-concept facets is being reordered during this age period, and the psychologically relevant facets were not measured in the present study. This interpretation is difficult to support, however, in light of two issues. From the theoretical standpoint (Shavelson et al., 1976), a primary distinction has been made in the hierarchical structure between academic and non-academic areas, thus, highlighting the role of academics and school in the formulation of self-concept. Students in the 11th and 12th grades clearly have sufficient information about their academic lives upon which to base self-evaluations. It would be difficult to argue, therefore,

that school is no longer a psychologically relevant area of their lives.

The second issue that renders this interpretation somewhat implausible is that the self-concept facets measured in the present study were most stable among the 11th and 12th grade sample. This finding is not indicative of a dramatic reordering of self-concept facets. On the basis of the present findings, a cautious skepticism regarding the hierarchical feature of self-concept is warranted.

An additional aspect of the hierarchical feature is that it has been described as an upwardly operating model. Shavelson and Bolus (1982) referred to an upwardly operating model such that when changes occur at the most specific levels of the hierarchy (i.e., perceptions of specific behaviors) any concomitant changes in self-concept would be expected to occur at the next most general level of the hierarchy. For example, perceptions of performance in mathematics would be most likely to result in changes in self-concept of ability in mathematics, somewhat less likely to cause changes in self-concept of overall academic ability, and least likely to cause changes in general self-concept. When changes do occur however, this feature of the construct predicts changes in the direction of specific to more general levels.

This aspect of the hierarchical feature was investigated through the examination of estimated regression coefficients between Time 1 and Time 2 factors. Support for

an upwardly operating model was not evident for any of the age groupings sampled. The only significant predictor of each factor at Time 2 was its own counterpart at Time 1.

Foremost among the implications of these findings is the need to clearly define what is meant by the term hierarchical. The few studies that have directly examined this feature of the construct have not clearly delineated its meaning. On the basis of the theoretical model proposed by Shavelson et al., it is a pervasive feature of the construct. The hypothesized hierarchy connotes a specific ordering of distinguishable facets and leads to further assumptions regarding the stability of facets. These assumptions are not well grounded in a theoretical rationale for a hierarchical structure and indeed may be somewhat arbitrary. It is of value to raise the question of whether there is sufficient reason for a hierarchical conceptualization of self-concept or whether it is a model being imposed without justification. The hierarchical feature of self-concept implies a specific organization of self-perceptions and could aid in explaining the structure of the construct, but it is necessary to develop a sound rationale for this as well as develop some criterial procedures for establishing support for it.

In the previous section, it was suggested that future efforts to study self-concept and its relationship to other variables of interest might best be directed toward the most specific facets of the construct. This might also prove to

be the most effective means of furthering our understanding of the hierarchical feature. In a study of self-perceptions of athletic ability, Ludwig and Maehr (1967) were able to demonstrate that changes in self-perceptions at specific levels resulted from direct intervention in the form of feedback from experts. The present study was non-experimental in nature and was therefore limited in terms of control over specific or systematic change. By introducing deliberate interventions directed toward specific areas of self-perception, in conjunction with further efforts to assess multiple levels of specificity, the hierarchical feature of self-concept may become more clearly understood. Rather than defining level of specificity as the degree of relationship to general self-concept, as was the case in the present study, level of specificity may be determined by degree of measurable change in self-perception as a direct consequent of deliberate intervention. This approach would still be consistent with the theoretical conception of an upwardly operating hierarchical model.

In conclusion, the extent to which self-concept conforms to a hierarchically ordered cognitive structure is not clearly understood. It is a pervasive feature of the existing construct definition but has limited empirical support. Continued efforts to study this feature of the construct calls for an elaborated theoretical rationale, more clearly developed criterial procedures, and a more exploratory, and perhaps experimental, approach.

The Stability Feature of Self-Concept

Within the theoretical framework conceptualized by Shavelson et al. (1976), general self-concept is described as a highly stable construct. As one descends the hierarchy of self-concept facets; however, self-concept becomes increasingly situation-specific and, as a result, less stable. This view is consistent with the multifaceted and hierarchical features of self-concept and with the view of an upwardly operating model for change.

This feature of self-concept was tested in the present study by examining the stability coefficients of the five self-concept facets measured. The stability feature was further examined in a developmental context by comparing patterns of stability coefficients for the three age groupings sampled. The rationale for examining the stability feature in a developmental context stems from earlier findings reported by Shavelson and Bolus (1982). These authors were unable to detect a pattern of decreasing stability, from general to specific self-concept facets, among a junior high school sample. According to Shavelson et al. (1976), self-concept develops in such a way as to become increasingly differentiated with age and maturity. Viewed from a developmental perspective, the Shavelson and Bolus finding of equally stable facets presented the possibility that junior high school students may not have sufficiently differentiated self-perceptions of school abilities to reveal varying levels of stability. Although Shavelson

and Bolus found support for a multifaceted interpretation of self-concept at this grade level, suggesting differentiated self-perceptions, the null findings with regard to varying stabilities suggested that these students' self-concepts are still relatively global in nature. In other words, general self-concept, overall academic self-concept, and subject-matter specific self-concepts share the attribute of being relatively stable over time for this age group. In order to probe this issue further the present study included older age groupings in order to examine the variable of age and its relationship to the stability of self-perceptions.

Consistent with the claim that self-concept becomes increasingly differentiated with age, it was hypothesized that a pattern of decreasing stability coefficients, from general to specific, would only be discernible for the older age groupings. Specifically, it was expected that the Shavelson and Bolus (1981) finding concerning equal stabilities would be replicated with the junior high school sample but that a pattern of decreasing stability would be apparent among both the 9th and 10th grade sample and the 11th and 12th grade sample. These hypotheses were supported only partially. For the 7th and 8th grade sample, all facets of self-concept were found to be highly stable and approximately equal, thus replicating the Shavelson and Bolus findings. For the 9th and 10th grade sample a pattern of differential stability was indeed apparent. Although general and overall academic self-concepts were equally

stable, they showed substantially greater stability than did subject-matter specific self-concepts (.89 for the former as opposed to a range of .60 to .70 for subject-matter specific). These findings were in accordance with expectations. The 9th and 10th grade age grouping showed a pattern of stability coefficients that more closely approximated a pattern of decreasing stability. If the 11th and 12th grade sample had shown a clear-cut pattern of decreasing stability coefficients, a general age trend would have been defensible. However, contrary to expectations, the oldest age grouping had the most stable self-perceptions in all facets (with the exception of overall academic self-concept which was approximately equal to the other two groups), and no clear pattern of decreasing stability was apparent. Like the 9th and 10th grade sample, general self-concept and overall academic self-concept were approximately equal in stability for the oldest age grouping. Subject-matter specific self-concepts in English and science were somewhat less stable; however, self-concept of ability in mathematics was .92, equaling that of general self-concept. This latter finding was unexpected. Theoretically, students' self-perceptions in a specific subject area are closely related to behavior and performance in that subject area and, therefore, would be expected to show some fluctuation over time. This expectation relies on the assumption that the students sampled have some immediate basis for reference, in this case enrollment in a mathematics course. Although

exact numbers were not made available to the researcher, it was estimated that approximately 75%, and very possibly more, of the 11th and 12th graders sampled were currently enrolled in mathematics courses--that as many as one quarter of these students may not have had an immediate mathematics reference base may partially account for this high degree of stability.

On the basis of the present findings, several tentative conclusions are offered. General self-concept and overall academic self-concept are highly stable by junior high school and remain relatively stable throughout high school. For all age groupings tested, the stability coefficients of overall academic self-concept approached or exceeded the stability coefficients of general self-concept. This finding was contrary to prediction for the two oldest age groupings sampled.

Self-concept of ability in specific subject areas was least stable for 9th and 10th graders as compared to both junior high school students and 11th and 12th graders. This finding may be reflective of the position these students hold in the academic system. Both 7th and 8th graders and 11th and 12th graders are nearing the completion of their academic levels; however, 9th and 10th graders are still relative newcomers to the high school system and may be in a more formative process of developing self-concepts of abilities at that level.

The hypothesis that self-concept decreases in stability as one descends the hierarchy of self-concept facets received only limited support in the present study. This finding may be due, in part, to the inability to establish a clear hierarchical ordering of facets. The stability feature was not found to be more discernible with age as expected. Rather, a unique pattern of stability coefficients was found for each age grouping. The stability of facets for the 9th and 10th grade sample most closely approximated a pattern of decreasing stability.

As recommended by Shavelson and Bolus (1982), a pattern of decreasing stability may be detectable if facets more specific than self-concept of ability in specific subjects were assessed or if the time interval between testings was greater than 6 months. Neither of these possibilities was ruled out in the present study.

With regard to the theoretical framework, there is a growing body of literature to support the view that general self-concept is highly stable and resistant to change. The feature of decreasing stability is still a viable explanation of how changes in self-concept come about. The key to establishing support for this feature of the construct may lie in the accurate identification of the specific experiences that students at various grade levels attend to most directly (e.g., grades, parental approval, direct feedback from teachers, peer referenced evaluation, etc.). The present study, and the findings of the Shavelson and Bolus

study (1982) which were replicated, suggest that subject-matter specific self-perceptions are very nearly as stable as overall academic and general self-perceptions.

The Developmental Feature of Self-Concept

The findings concerning the developmental feature of self-concept, in effect, comprise a summary of all aspects of the study. Multiple age groups were sampled and studied for the express purpose of examining the development of self-structures during adolescents. Specifically, the definitional features of self-concept described by Shavelson et al. (1976) were tested for invariance across age groupings.

The multifaceted feature of self-concept was found to be invariant across age groupings. This finding suggests that adolescents hold multiple perceptions of themselves that are organized into interrelated but distinguishable categories. In the present study these categories included general, overall academic, and subject-matter specific facets. Shavelson et al. (1976) described the multifaceted feature as a reflection of a category system that is adopted by a single individual or shared by a group. The findings of the present study support the view that there is a common category system among middle-class adolescents with regard to their general and academic self-perceptions. The match between this age group and this particular category system

is logically and theoretically plausible. Clearly, self-perceptions are based upon experience and a common set of experiences for most adolescents in junior and senior high school. Groups of persons or individuals not participating in an academic setting may have an entirely different category system or no category system for the academic area.

The data suggest that the relationships among the facet components of this category system are not uniform for all of the age groupings sampled. There was some evidence that the facets measured approximated a hierarchical structure for the two youngest age groupings but not for the 11th and 12th graders. With regard to the development of self-concept in adolescence, this finding is of interest. The correlations between each of the academic facets (overall academic and subject-matter specific) and general self-concept were estimated for each of the three age groupings. The relationships between academic facets and general self-concept are lowest in the 11th and 12th grade sample for 10 out of 12 comparisons. Because these comparisons are cross-sectional and cohort effects may be operating, cautious interpretation is warranted; however, the consistently low correlations between academic facets and general self-concept for this age grouping suggests that toward the end of high school perceptions of academic abilities are less central to the students' general feelings of self-worth.

The stability coefficients of the self-concept facets suggest several implications for the development of self-

concept during adolescence. The 15 stability coefficients that were estimated ranged from .60 to .94, suggesting a moderate to high degree of stability for all facets at all grade levels.

For the 7th and 8th grade sample, stability coefficients ranged from .76 to .94. No pattern of correlations was apparent for this age grouping. These findings are comparable to those reported by Shavelson and Bolus (1982) and suggest that junior high school students' self-perceptions in general and in relation to their school lives remain quite stable within a single academic year.

For the 9th and 10th grade sample, stability coefficients ranged from .60 to .89. The distinguishing feature for this age grouping was that subject-matter specific self-concepts were considerably less stable than the more general facets, suggesting that early high school may be a period during which students are experiencing some uncertainty about their academic abilities.

In contrast, self-concept facets were most stable for the 11th and 12th grade sample. For this age grouping, stability coefficients ranged from .80 to .92. The 11th and 12th graders differed markedly from the younger age groupings in terms of both the interrelationships among facets and the stability of the facets. This age grouping showed the lowest relationships between academic self-perceptions and general self-concept and yet had the most stable self-perceptions.

Conclusions

On the basis of the present findings, it may be concluded that some features of self-concept were common to all of the sub-groupings of adolescents studied, and other features appeared to be specific to certain age ranges. The data indicated that self-perceptions were categorized in a similar fashion for 7th through 12th graders but that the relationships among the categories were not the same. For the 7th and 8th grade sample and the 9th and 10th grade sample, self-concept facets showed some fluctuation (relative instability) over a 6-month period, particularly self-concept in specific subject areas, and as expected, subject matter specific facets showed a lesser relationship to general self-concept than did overall academic self-concept. The 11th and 12th grade sample differed from their younger cohorts in both of these areas. For the oldest age grouping, self-concept was highly stable in all areas, and the more specific facets showed very little relationship to general self-concept. These findings are consistent with the general conclusion drawn by O'Malley and Backman (1979). In a follow-up study of high school seniors, these authors reported that academics and school become less central to self-concept toward the end of high school.

These findings are significant from a developmental perspective. The results of Shavelson and Bolus (1982) were replicated with regard to the multifaceted feature and found

to be applicable to junior high and senior high school students. The developmental feature of self-concept has thus far been narrowly defined as increased differentiation of self-concept facets with age (Shavelson, Hubner, & Stanton, 1976; Shavelson & Bolus, 1982). With regard to this definitional feature, the present study supported the contention that self-concept is multifaceted but did not demonstrate that it becomes more multifaceted with age. Rather, it was hypothesized at the outset of this study that the developmental nature of self-concept was not restricted to the feature of multiple facets but that other features of the construct might also be age-related. Specifically, it was hypothesized that the feature of decreasing stability from general to specific facets was an age-related aspect of the construct, and an attempt was made to demonstrate this through age group comparisons. Although some age group differences in stability coefficients were noted, they were not in the direction predicted (i.e., the stability feature did not appear to be more pronounced for older age groups). These data, however, may serve the useful purpose of generating hypotheses regarding the developmental feature of self-concept. It continues to be probable that several features of the construct interact in complex ways in the course of self-concept development. These are described briefly below and may be taken as recommendations for the further study of self-concept development.

The shift from global to differentiated self-perceptions in the multifaceted feature of self-concept warrants further study. The focus of this study was the differentiation of the academic self-concept. If development of social self-perceptions had been the focus, the findings with regard to the developmental features of self-concept might have been quite different. Similarly, if the procedures employed in the present study had been applied to a sampling of adults not directly involved in academic pursuits, quite different facets of self concept would have been relevant. The study of the development of self-concept requires that specific areas of self-perception be identified and examined in terms of their relevance for the age and life concerns of the individuals.

The hierarchical feature of self-concept has been discussed at length in this study. There is a need to develop a stronger theoretical rationale for the hierarchical feature and to develop criterial procedures to study it. The limited support that the hierarchical feature of self-concept received in the present study suggests that it too may be developmentally related. The correlations among the self-concept facets for junior high school and early high school students approximated what might be found in a hierarchical structure. This finding, in conjunction with the interpretation that academic concerns may become less central to self-concept toward the end of high school, suggests that hierarchies of self-perceptions may form for

different facet areas during different developmental periods. To carry this line of reasoning a step further, it is also conceivable that as persons take on new roles or anticipate new roles, hierarchical structures change to accommodate the new role. This feature of self-concept, and of cognitive structures in general, has rich potential for further study but may require the refinement of current methods and procedures.

The issue of self-concept stability pervades other features of the construct and has implications for the development of self-concept. It is of interest to note that for the oldest age grouping sampled in the present study, academic self-concept facets were most stable on the average and least related to general self-concept. If, in fact, academic pursuits become less central to self-concept toward the end of the high school years, this finding implies that self-perceptions may stabilize as persons prepare to change their basis for self-reference and evaluation. However, if these students were to enter college, academic self-perceptions could become central to self-concept once more and continue to develop during their college experience.

These issues may be summarized by suggesting that the developmental feature of self-concept involves the interaction of several other definitional features of the construct. The study of self-concept development may be most productive if attention is paid to those areas of self-perception that are most relevant to the individual at that

particular stage of development. Relevant facet areas would include those areas in which the individual is engaged in behaviors that provide a basis for self-reference and evaluation and in which the individual values performance. It is highly probable that the definition of self-concept is dependent in part on these situational factors. It would be of considerable value to determine whether, when these conditions are met, self-concept has certain definitional characteristics (e.g., hierarchically ordered to allow for changes to occur on the basis of self-inferences). Conversely, it would be of value to determine whether, when these conditions are not met and the self-concept facet area is comparatively inactive, the construct has different definitional characteristics (e.g., relatively stabilized until otherwise engaged).

Finally, procedural issues suggested by Shavelson and Bolus (1982) should be reemphasized. In reference to the design of their own study, which was replicated here, these authors pointed out that they did not provide the best possible test for the stability feature. They recommended that efforts be made to assess more specific levels of the facet areas of interest and that efforts be made to lengthen the time period between data collections. The employment of these procedures, in the context of the present research design, would increase the likelihood of revealing the pattern of developmental changes in the stability of self-concept.

APPENDIX A

PARENTAL CONSENT FORM

This letter is to request your consent for your child to participate in a research study. The purpose of the study is to gather information regarding middle school and high school students' perceptions of themselves, particularly in regard to school and academic ability.

Participation will involve two 50 minute testing sessions. The first will be held this fall and the second will be held in approximately six months. During the testing sessions your child will be asked to respond to a series of paper and pencil test items concerning how they perceive themselves in general and in school in particular. Your child's responses will be kept confidential. Participation will not involve any risk or discomfort to your child. The information we obtain from the study will help us to better understand how students in your child's age group perceive themselves and their abilities in school. Your child will be free to discontinue participation in the study at any time without participation.

Please indicate consent for your child to participate by signing below. If you have any questions about the study we will be happy to answer them.

Parent's signature

Date

Investigator's signature

Paul Ewald
Foundations of Education
University of Florida

APPENDIX B

The following instructions were taken from the published scales and read to all research participants prior to responding to the test battery.

Tennessee Self-Concept Scale:

The statements in this booklet are to help you describe yourself as you see yourself. Please respond to them as if you were describing yourself to yourself. Do not omit any item. Read each statement carefully and select one of the responses listed below. (Fitts, 1965)

The Piers-Harris Childrens Self-Concept Scale:

Here are a set of statements that tell how some people feel about themselves. Read each statement and decide whether or not it describes the way you feel about yourself. If it is true or mostly true for you, circle the word "yes." If it is false or mostly false for you circle the word "no." Answer every question even if some are hard to decide. Do not circle both yes and no for the same statement.

Remember that there are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside. (Piers, 1969)

Michigan State Self-Concept of Ability--General:

Circle the letter in front of the statement which best answers each question.

Michigan State Self-Concept of Ability--Specific Subject:

Put an "X" in the box under the heading which best answers the question. Answer for all three subjects. (You will have an "X" on each line.) (Brookover, LePere, Hamachek, Thomas, & Erickson, 1965)

REFERENCES

- Bentler, P.M. (1972). Review of the Tennessee Self-Concept Scale. In O.K. Buros (Ed.), The Seventh Mental Measurements Yearbook (Vol. 1, pp. 366-367). Highland Park, New Jersey: The Gryphon Press.
- Bentler, P.M., & Bonnett, D. (1980). Significance tests and goodness of fit in the analysis of covariance structures. Psychological Bulletin, 88, 588-606.
- Brookover, W.B. & Erickson, E.L. (1969). Society, schools and learning. Boston: Allyn & Bacon.
- Brookover, W.B., LePere, J.M., Hamachek, D.E., Thomas, S., & Erickson, E.L. (1965). Self-concept of ability and school achievement, II. USOE Cooperative Research Report, Project No. 1636. East Lansing: Michigan State University.
- Brownfain, J.J. (1952). Stability of the self-concept as a dimension of personality. Journal of Abnormal and Social Psychology, 47, 597-606.
- Campbell, D.T. (1957). Factors relevant to the validity of experiments in social setting. Psychological Bulletin, 54, 297-312.
- Campbell, D.T., & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-105.
- Castenada, A., McCandless, B.R., & Palermo, D.S. (1956). The child's form of the Manifest Anxiety Scale. Child Development, 27, 317-326.
- Combs, A.W., & Soper, D.W. (1957). The self, its derivative terms, and research. Journal of Individual Psychology, 13, 134-145.
- Coopersmith, S. (1967). The antecedents of self-esteem. San Francisco: Freeman.

- Cronbach, L.J., & Meehl, P.E. (1955). Construct validity in psychological tests. Psychological Bulletin, 52, 281-302.
- Crowne, D.P., & Stephens, M.W. (1961). Self-acceptance and self-evaluating behavior. Psychological Bulletin, 58, 104-121.
- Dyer, C.O. (1964). Construct validity of self-concept by a multitrait-multimethod analysis. Dissertation Abstracts, 25, 8154.
- Engel, M. (1959). The stability of self-concept in adolescence. Journal of Abnormal and Social Psychology, 58, 211-215.
- Epstein, S. (1973). The self-concept revisited. American Psychologist, 28, 404-416.
- Erikson, E. (1950). Childhood and society. New York: Norton.
- Faust, M.S. (1960). Developmental maturity as a determinant of prestige in adolescent girls. Child Development, 31, 173-184.
- Fernandez, M.W., Michael, W.B., & Smith, R.A. (1978). The factorial validity of three forms of the dimensions of self-concept measure. Educational and Psychological Measurement, 38, 537-545.
- Fitts, W.H. (1965). Manual for the Tennessee Self-Concept Scale. Nashville, Tennessee: Counselor Recordings and Tests.
- Flavell, J.H., Shipstead, S.G., & Croft, K. (1978). What young children think you see when their eyes are closed. Unpublished manuscript, Stanford University.
- Fleming, J.S., & Watts, W.A. (1980). The dimensionality of self-esteem: Some results for a college sample. Journal of Personality and Social Psychology, 39, 921-929.
- Gibson, E.J. (1969). Principles of perceptual learning and development. New York: Appleton-Century-Crofts.
- Gordon, I.J. (1966). Studying the child in school. New York: John Wiley.
- Gray, S.W., & Klaus, R.A. (1970). The early training project: A seventh year report. Child Development, 41, 909-924.

- Halliday, M.A.K. (1975). Learning how to mean: Explorations in the development of language. London: Arnold.
- Horney, K. (1950). Neurosis and human growth. New York: Norton.
- James, W. (1896) The principles of psychology (Vol. 1). New York: Henry Holt & Company.
- Janis, I.S., & Field, P.B. (1959). A behavioral assessment of persuasibility: Consistent of individual differences. In C.I. Hovland & I.L. Janis (Eds.), Personality and persuasibility. New Haven: Yale University Press.
- Jersild, A.T. (1952). In search of self. New York: Teachers College Bureau of Publications.
- Jones, M.C., & Mussen, P.H. (1958). Self-conceptions, motivations, and interpersonal attitudes of early- and late-maturity girls. Child Development, 29, 491-501.
- Joreskog, K.G., & Sorbom, D. (1978). LISREL IV, A general computer program for estimating a linear structural equation system involving multiple indicators of unmeasured variables. Chicago: National Education Resources.
- Katz, P., & Zigler, E. (1967). Self-image disparity: A developmental approach. Journal of Personality and Social Psychology, 5, 186-195.
- Kohlberg, L. (1976). Moral stages and moralization: The cognitive-developmental approach. In T. Lickona (Ed.), Moral development and behavior: Theory, research, and social issues. New York: Holt, Rinehart, & Winston.
- Kokenes, B.M. (1974). A factor analytic study of the Coopersmith Self-Esteem Inventory. Dissertation Abstracts International, 74, 4877A.
- Lewis, M., & Brooks, J. (1974). Self, other, and fear: Infants' reactions to people. In M. Lewis & L.A. Rosenblum (Eds.), The origins of fear. New York: Wiley.
- Lipsitt, L.P. (1958). A self-concept scale for children and its relationship to the children's form of the Manifest Anxiety Scale. Child Development, 29, 463-472.

- Logsdon, D.M., & Ewert, B. (1973). Longitudinal study of an operational model for enhancing central city youths' self-concept, academic achievement, attitude toward school, participation in school and socialization/maturation. Milwaukee, Wisconsin: University of Wisconsin. (ERIC Document Reproduction Service No. ED 113 632).
- Long, B., Henderson, E.H., & Ziller, R.C. (1967). Developmental changes in the self-concept during middle childhood. Merrill-Palmer Quarterly of Behavior and Development, 13, 201-215.
- Ludwig, D.J., & Maehr, M.L. (1967). Changes in self-concept and stated behavioral preference. Child Development, 38, 453-467.
- Marcia, J.E. (1980). Identity in adolescence. In J. Adelson (Ed.), Handbook of adolescent psychology. New York: John Wiley & Sons.
- Marsh, H.W., Smith, I.D., Barnes, J., & Butler, S. (1983). Self-concept: Reliability, dimensionality, validity, and the measurement of change. Journal of Educational Psychology, 75, 772-790.
- Marsh, H.W., Smith, I.D., & Barnes, J. (1983). Multitrait-multimethod analyses of interpretations based upon the SDQ: Student-teacher agreement on multidimensional ratings of student self-concept. American Educational Research Journal, 20, 333-357.
- Marx, R.W., & Winne, P.H. (1978). Construct interpretations of three self-concept inventories. American Educational Research Journal, 15, 99-109.
- Maslow, A. (1954). Motivation and personality. New York: Harper.
- Michael, W.B., & Smith, R.A. (1976). The development and preliminary validation of three forms of a self-concept measure involving school related activities. Educational and Psychological Measurement, 36, 521-528.
- Michael, W.B., Smith, R.A., & Michael, J.J. (1975). The factorial validity of the Piers-Harris Children's Self-Concept Scale for each of three samples of elementary, junior high, and senior high school students in a large metropolitan school district. Educational and Psychological Measurement, 35, 405-414.
- Mullener, N., & Laird, J.D. (1971). Some developmental changes in the organization of self-evaluations. Developmental Psychology, 5, 237-243.

- O'Malley, P.M., & Backman, J.G. (1979). Self-esteem and education: Sex and cohort comparisons among high school seniors. Journal of Personality and Social Psychology, 37, 1153-1159.
- Paterson, A.L. (1967). An evaluation of an instrument designed to measure the construct "self-concept of academic ability." Dissertation Abstracts, 27, (12-14), 4341-4342.
- Peskin, H. (1967). Pubertal onset and ego functioning. Journal of Abnormal Psychology, 72, 1-15.
- Peterson, A.C., & Taylor, B. (1980). The biological approach to adolescence: Biological change and psychological adaptation. In J. Adelson (Ed.), Handbook of adolescent psychology. New York: Wiley.
- Piaget, J. (1962). Play, dreams and imitation in childhood. New York: W.W. Norton.
- Piaget, J. (1969). The mechanisms of perception. London: Routledge and Kegan Paul.
- Piers, E.V. (1969). Manual for the Piers-Harris, children's self-concept scale. Nashville, Tennessee: Counselor Recordings and Tests.
- Piers, E.V., & Harris, D.A. (1964). Age and other correlates of self-concept in children. Journal of Educational Psychology, 55, 91-95.
- Purkey, W.W. (1970). Self-concept and school achievement. Englewood Cliffs, New Jersey: Prentice-Hall.
- Rathbone, C. (1971). The implicit rationale of the open education classroom. In C. Rathbone (Ed.), Open education. New York: Citation Press.
- Reckless, W.C., & Dinitz, S. (1972). The prevention of juvenile delinquency: An experiment. Columbus, Ohio: Ohio State University Press.
- Rentz, R.R., & White, W.F. (1967). Factors of self-perception in the Tennessee Self-Concept Scale. Perceptual and Motor Skills, 24, 118.
- Sarbin, T.R. (1959). A preface to a psychological analysis of the self. Psychology Review, 52, 11-22.
- Sears, P., & Sherman, V. (1964). In pursuit of self-esteem. Belmont, California: Wadsworth.

- Shavelson, R.J., & Bolus, R. (1982). Self-concept: The interplay of theory and methods. Journal of Educational Psychology, 74, 3-17.
- Shavelson, R.J., Hubner, J.J., & Stanton, G.C. (1976). Self-concept: Validation of construct interpretations. Review of Educational Research, 46, 407-441.
- Scheirer, M.A., & Kraut, R.E. (1979). Increasing educational achievement via self-concept change. Review of Educational Research, 49, 131-150.
- Suinn, R.M. (1972). Review of the Tennessee Self-Concept Scale. In O.K. Buros (Ed.), The seventh mental measurements yearbook: Vol.1. (pp. 367-369). Highland Park, New Jersey: The Gryphon Press.
- Trickett, H. (1969). Stability and predictability of children's self-concept and perceptions by others: A developmental study. Dissertation Abstracts International, 29, 2557A.
- Vacchiano, R.B., Strauss, P.S., & Schiffman, D.C. Personality correlates of dogmatism. Journal of Consulting and Clinical Psychology, 32, 83-85.
- Werner, H. (1948). Comparative psychology of mental development. Chicago: Pollett.
- Werner, H. (1957). The conception of development from a comparative and organismic point of view. In D. Harris (Ed.), The concept of development. Minneapolis: University of Minnesota Press.
- Winne, P.H., Marx, R.W., & Taylor, T.D. (1977). A multitrait-multimethod study of three self-concept inventories. Child Development, 48, 893-901.
- Wylie, R. (1961). The self-concept: A critical survey of pertinent research literature. Lincoln: University of Nebraska Press.
- Wylie, R. (1974). The self-concept, revised edition, Vol. 1: A review of methodological considerations and measuring instruments. Lincoln: University of Nebraska Press.
- Zirkel, P.A. (1972). Enhancing the self-concept of disadvantaged students. California Journal of Educational Research, 23, 125-137.

BIOGRAPHICAL SKETCH

Paul Ewald is originally from Palatine, Illinois, a northwest suburb of Chicago. He graduated from Campion High School in Prairie du Chien, Wisconsin, and subsequently attended Creighton University in Omaha, Nebraska, where he received a B.A. degree in psychology in 1977. Following several years of employment in human service settings, he resumed his education at Eastern Illinois University in Charleston, Illinois, where he received an M.S. Ed. in community counseling in 1981. In the fall of 1981, he began the doctoral program in educational psychology at the University of Florida. He currently holds the position of assistant professor of education and psychology at Westmar College in LeMars, Iowa. He is married to Pam Ingram of Peoria, Illinois.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



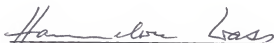
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James Algina, Cochairman
Associate Professor of Foundations
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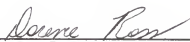


Hannelore Wass
Professor of Foundations of
Education

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Stephen Olejnik
Associate Professor of Foundations
Education

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Dorene Ross
Associate Professor of General
Teacher Education

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May, 1985


Chairman, Foundations of Education


Dean, College of Education

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